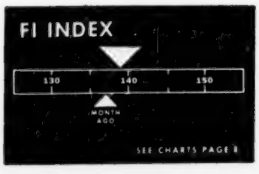
NATIONAL EDITION

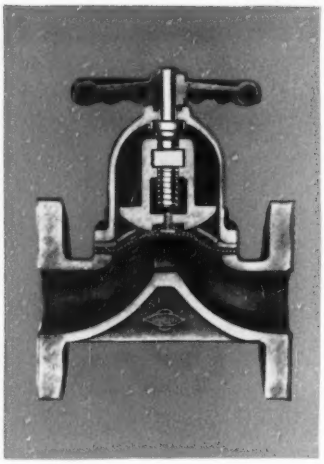
Food Industries

For those who control quality and costs through management and production—a McGraw-Hill publication

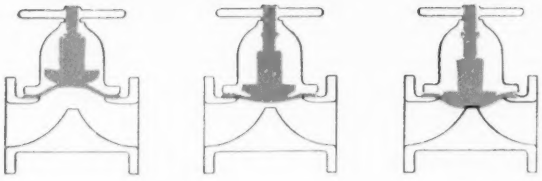
Sanitary, tile-walled, air-conditioned fermentation room connotes advanced design in pace-setting Fuchs bakery. (Page 72)



AUGUST, 1950: Military food, Ask consumers, Success with infant formulas, Savings can boost quality, Candy storage report, Nutritional yeast

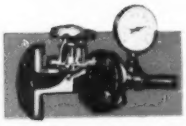


If you need a diaphragm valve you need all the advantages of diaphragm closing



Check these popular features of

GRINNELL-SAUNDERS DIAPHRAGM VALVES



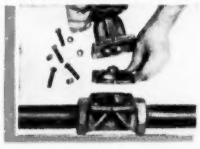
Diaphragm gives leak-tight closure against grit, scale, solid matter . . . Even when something as substantial as an 8-penny nail is trapped on the weir of a rubber lined valve, as illustrated, the resilient diaphragm, plus the large area of contact, gives leak-tight closure against pressure or vacuum.

Diaphragm lifts high for streamlined flow in either direction . . . Smooth, streamlined passage, without pockets, prevents trapping of sludge and reduces frictional resistance to a minimum—irrespective of direction of fluid flow. No disc holder in fluid stream. Grinnell-Saunders Diaphragm Valves are self-draining when installed with the spindle at 15 degrees above the horizontal position.

Diaphragm absolutely isolates working parts from fluid . . . There's no "if" about the way a continuous, one-piece diaphragm seals off the working parts from fluids; no perforation or puncture in the diaphragm where fluid or gas can possibly leak by the valve spindle. No sticking, clogging or corroding of working parts. Valve lubricant cannot contaminate the fluid in the line.

Diaphragm, body and lining materials to meet particular conditions . . . Bodies stocked in cast iron, malleable iron, stainless steel, bronze and aluminum: other materials on special orders. Valve bodies lined with lead, glass, natural rubber or neoprene. Diaphragm materials of natural rubber or synthetics. Working pressure, 150 lbs.; maximum temperature, 180°F.

Diaphragm is only part that normally wears and needs replacement . . . Depending on the type of service, it may last for years, particularly since the compressor and finger plate combine to support the diaphragm in all positions. The diaphragm can be replaced quickly without removing valve from line. No refacing or reseating. No disc holder to require tightening or replacing. No packing glands to demand attention.



Write today for the new Grinnell-Saunders Diaphragm Valve Catalog 4-S.

GRINNELL

Grinnell Company, Inc., Providence 1, R. I. Warehouses: Atlanta • Buffalo • Charlotte • Chicago • Cleveland • Cranston • Fresno • Kansas City • Houston • Long Beach Los Angeles • Milwaukee • Minneapolis • New York • Oakland • Philadelphia • Pocatello • Sacramento • St. Louis • St. Paul • San Francisco • Seattle • Spakane

FOOD INDUSTRIES, August, 1950, Vol. 22, No. 8. Published monthly by McGraw-Hill Publishing Co., Inc. Publisher, Wallace F. Traendly. Price 50c per copy. Publication Office, 99-129 N. Broadway, Albany 1, N. Y. Subscription rates: United States and possessions, $3 for 1 yr., $4 for 2 yr., $5 for 3 yr. Canada, $4 for 1 yr., $6 for 2 yr., $8 for 3 yr. (payable in Canadian or U. S. funds). Pan American Countries, $5 for 1 yr., $8 for 2 yr., $10 for 3 yr. Entered as second class matter Aug. 26, 1948, at Albany post office under Act of Mar. 3, 1879.

FREE READER SERVICE . . .

HOW TO USE POSTCARD

Circle numbers of items you want to know more about; fill in your name and address; drop in mail (no postage required). We will tell companies what you are interested in and they reply direct to you.

TO MAKE IT HANDY

Products and literature in this issue are listed on these pages. There are three indexes: (1) editorial items on new equipment, new products, new literature; (2) products advertised; (3) advertisers.

WHAT THE NUMBERS MEAN

Advertisements: There is a page number on the postcard for each advertisement. Before the number may appear, L, R, T, B (left, right, top, bottom) locating the ad on the page; small letters following (a, b, c) indicate additional products in the advertisement.

Editorial Items: There is a page number on the postcard for each editorial item; ABC's distinguish the specific items on the page.

EDITORIAL ITEMS

For more data, circle item number on postcard

NEW EQUIPMENT

	page		page
Beer barrel, aluminum	96A	Pickle balance	94B
Candy packer, tray feed	90A	Pump, deep well	96B
Carton filler, adjustable	92A	Pump, laboratory size	95A
Cleaning compound, colored	96C	Steam trap, stainless	98A
Consistometer	98C	T-fitting, stainless steel	96D
Dairy control valve	98D	Tomato peeler	90B
De-humidifier	94A	Truck-trailer, dump ramp	92C
Dry ice slabber	95B	Vinyl paint, for concrete	98E
Floor cleaning machine	98B	Water conditioner, 2-stage	91B
Homogenizer, floating piston	92B	Wrapper, small unit, cracker pack	91A
Pan greaser, conveyor style	92D		

NEW PRODUCTS

	page		page
Beans, pre-cooked	118A	Oleo, new-regulations packs	115A-B
Beer carrier, 3-can	112C	Potatoes, sliced, packaged	115D
Bread-roll mix	112F	Salmon cutlets, frozen, tinned	112E
Center opening tin, ham	112D	Sweetener, non-caloric	118E
Chewing gum, jumbo pack	112A	Tuna, infant style	118C
Diamond shaped tin	112B	Vegetable salad, canned	116A
French bread, brown'n'serve	116B	Wine, imported Tyrolean	118B
Frozen suckers, home made	118D		
Mustard, aluminum tube	115C		

NEW TECHNICAL LITERATURE

	page		page
Air control, breathers filters, dryers	157A	Conveyor parts	156B
Air pump, rotary	155B	Dryer, air control	157A
Amplifier, indicating	157F	Dryer, freeze method	155A
Bacon machinery	155P	Dust filter	156H
Bakery cleansers	157I	Elevators, conveyor	156C
Banana box, aluminum	156D	Expansion joints, packless	156A
Boiler embrittlement	158J	Extractor, centrifugal	155N
Breather, air control	157A	Fan, ventilating	155H
Centrifugal pumps	155D	Filler, rotary	155O
Centrifugal pumps	155L	Filter, air-control	157A
Centrifuge, perforate	155F	Filter, dust	156H
Chemical products	158G	Flow control meters	156J
Chocolate refiner	155M	Flow exhibit meters	156J
Cleansers, colored	157I	Fork lift methods study	156F
Clutch, automatic for gas, electric motors	155I	Freeze-drying equipment	155A
Colloid mill, triple action	155G	Gear reducers	155C
Commodity buying, selling	158C	Glassware, laboratory	157C
Controller, potentiometer	157G	Indicating amplifier	157F
Control, process standard	157B	Labeling tips	158I
Conveyor elevators	156C	Laboratory appliances	156I
		Laboratory glassware	147C

Turn to next page

READER SERVICE POSTCARD

EDITORIAL ITEMS

No 4551

90A	96A	112D	118C	155I	156B					
90B	96B	112E	118D	155J	156C					
91A	96C	112F	118E	155K	156D					
91B	96D	115A	155A	155L	156E					
92A	98A	115B	155B	155M	156F					
92B	98B	115C	155C	155N	156G					
92C	98C	115D	155D	155O	156H	157C	157H	158B	158G	
92D	98D	116A	155E	155P	156I	157D	157I	158C	158H	
94A	98E	116B	155F	155Q	156J	157E	157J	158D	158I	
94B	112A	118A	155G	155R	157A	157F	157K	158E	158J	
95A	112B	118B	155H	156A	157B	157G	158A	158F	158K	
95B	112C									

ADVERTISEMENTS

2	17f	94a	108h	123a	B137	155	170a	180k	201
4a	17g	94b	108i	123b	138	156	170b	180l	202
4b	18–19a	94c	108j	124	T139	157	171	181a	203
4c	18–19b	95	109	125	B139	158	172–173	181b	204
4d	18–19c	96	110	B126	140a	159	174a	182	205
6a	20	97	111a	T126a	140b	160	174b	183	206
6b	21	98a	111b	T126b	140c	LB161	175	184	T212
10	22a	98b	111c	127a	140d	RT161	176	185	B212
12–13a	22b	99	113	127b	141	162a	177	186a	L213
12–13b	23a	100a	114a	127c	142	162b	178a	186b	TR213
12–13c	23b	100b	114b	127d	143	162c	178b	188	TR214
12–13d	24–25	101	114c	127e	144	162d	179	189	BR214
12–13e	26	106	114d	128	T146	163a	180a	190	215a
12–13f	27	107a	115	T131	B146	163b	180b	191	215b
14	28	107b	116	B131	147	T164	180c	192	215c
15	29	108a	117	133a	T148	B164	180d	193	215d
16	30	108b	T118a	133b	B148	165	180e	194	216
17a	31	108c	T118b	133c	149	166	180f	195	
17b	32	108d	B118	133d	150	167	180g	196	
17c	33	108e	119	135	152	168	180h	197	
17d	34	108f	120	136	153	T169	180i	199	
17e	93	108g	122	T137	154	B169	180j	200	

OTHER REQUEST, OR COMMENT.....

.....

Name..... Position.....

Company .....

Address .....

Card Expires November 10, 1950

READER SERVICE POSTCARD

EDITORIAL ITEMS

No 4551

90A	96A	112D	118C	155I	156B					
90B	96B	112E	118D	155J	156C					
91A	96C	112F	118E	155K	156D					
91B	96D	115A	155A	155L	156E					
92A	98A	115B	155B	155M	156F					
92B	98B	115C	155C	155N	156G					
92C	98C	115D	155D	155O	156H	157C	157H	158B	158G	
92D	98D	116A	155E	155P	156I	157D	157I	158C	158H	
94A	98E	116B	155F	155Q	156J	157E	157J	158D	158I	
94B	112A	118A	155G	155R	157A	157F	157K	158E	158J	
95A	112B	118B	155H	156A	157B	157G	158A	158F	158K	
95B	112C									

ADVERTISEMENTS

2	17f	94a	108h	123a	B137	155	170a	180k	201
4a	17g	94b	108i	123b	138	156	170b	180l	202
4b	18–19a	94c	108j	124	T139	157	171	181a	203
4c	18–19b	95	109	125	B139	158	172–173	181b	204
4d	18–19c	96	110	B126	140a	159	174a	182	205
6a	20	97	111a	T126a	140b	160	174b	183	206
6b	21	98a	111b	T126b	140c	LB161	175	184	T212
10	22a	98b	111c	127a	140d	RT161	176	185	B212
12–13a	22b	99	113	127b	141	162a	177	186a	L213
12–13b	23a	100a	114a	127c	142	162b	178a	186b	TR213
12–13c	23b	100b	114b	127d	143	162c	178b	188	TR214
12–13d	24–25	101	114c	127e	144	162d	179	189	BR214
12–13e	26	106	114d	128	T146	163a	180a	190	215a
12–13f	27	107a	115	T131	B146	163b	180b	191	215b
14	28	107b	116	B131	147	T164	180c	192	215c
15	29	108a	117	133a	T148	B164	180d	193	215d
16	30	108b	T118a	133b	B148	165	180e	194	216
17a	31	108c	T118b	133c	149	166	180f	195	
17b	32	108d	B118	133d	150	167	180g	196	
17c	33	108e	119	135	152	168	180h	197	
17d	34	108f	120	136	153	T169	180i	199	
17e	93	108g	122	T137	154	B169	180j	200	

OTHER REQUEST, OR COMMENT.....

.....

Address .....

Name..... Position.....

Company .....

Card Expires November 10, 1950

EDITORIAL ITEMS (Cont'd from 1st page)

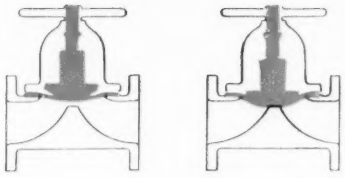
	page
Lift truck, hydraulic	156G
Liquid meter, syrups	155J
Magnetic separator	155R
Matting	157J
Meters, control, exhibit	156J
Meters, liquid	155J
Mill, colloid triple action	155G
Packager, transparent wrap	155Q
Packaging methods	158K
Packer, bacon	155P
Phosphoric acid handling	158H
Potentiometer control	157G
Presser, bacon	155P
Process standard control	157B
Pumps, centrifugal	155D
Pumps, centrifugal	155L
Pumps, rotary air	155B
Racks	156E
Racks, storage	157K
Receiving vats	155K
Reducer, gear	155C
Reducing valves	155E
Refiner, chocolate	155M
Refrigeration, profit building	158D
Regulating valves	155E
Rollers, conveyor	156B
Rotary air pumps	155B
Rotary cabinet storage	158A
Seasonings	158B
Separator, magnetic	155R
Slicer, bacon	155P
Strainer, fine screen	157H
Stainless steel, graded	158E
Thermometers, gas, liquid	157D
Thermoplastic	158F
Truck, hydraulic lift	156G
Valves, reducing, regulating	155E
Vats, receiving	155K
Ventilating fans	155H
Water conditioner, 2-phase	157E
Wheels, conveyor	156B

PRODUCTS ADVERTISED

For more data, circle number on postcard

	page
Adjustable-speed manual	12-13c
Batteries, electric, industrial	189
Belts	
Conveyor	
Flat wire	T148
Flexible steel	B169
Impregnated duck	T164
V	150
Wire	143
Boilers, steam	B131
Brine process	168
Brushes, rotary	135
Casters	123a
Casters, swivel fork	T126a
Centrifugals, continuous	16
Chain	
Conveyor	159
Roller, steel	6a
Chemicals	
Glycerine	193
Monoglycerides	
Flaked solid	100b
Plastic fat	100a
Industrial, National Chem. Exposition	144
Chlorination process	147
Coils, heating & cooling	203
Booklet	140c
Meat packers, booklet	140d
Food processors, booklet	140b
Bottlers, booklet	140a
Closures	
Metal caps, glass container	18-19c
Screw caps	149
Cold storage and freezing	B146
Condensers, vapor	181b
Containers	
Bags	
General line	199
Booklet	98a
Boxes, corrugated and solid fibre	215a
Cans, sanitary tin	191
Cartons	99
Folding cartons	215b
General line	101
Glass	18-19a, 113
Kraft bags and sacks	215
Spray	128
Steel drums, lithographed	71
Steel drums and pails	141
Control systems	26
Conveyors	
Belt	94a
Bulk handling	190
Bulk mats, vibrating	156
Cable	T118a
Overhead trolley	94b
Roller	94c
Spiral chute	T139
Tubular chain	T118b
Cooker and mixer	66
Corn-oil heating	185
Covers, drum	
Hinge-type	123a
Slip-over type	123b
Cranes, single beam	170a
Dolly, drum	133d
Doors, cold storage	195
Drums, aluminum	133a
Dumpers, bulk mats	M126
Electrodes, glass	22b
Electronic speed variator	12-13e
Enzymes, industrial	
Amylolytic	114c
Lactase	114d
Pectinolytic	114a
Proteolytic	114b
Fabricators	
Calciners	162b
Coolers	162c
Dryers	10
Dryers, bulletin	162a
Heat exchangers	152
Kilns	162d
Process equipment, metal	200
Filters, horizontal plate type	T169
Flavors	
Corps praline	27
Coumarin	17a
Ethyl vanillin	17b
Fruit	117
General line	163b
General line, booklet	17e
Methyl salicylate	17d
Monosodium glutamate	LB161
Saccharin	17e
Soluble seasoning	15
Spice	163a
Strawberry	209
Vanillin	17f
Flavors and aromas, general line	17g
Gas, for commercial baking	119
Generators, steam	194
Glue	
Bottle, label	L213
Handbook	28
Grease, lubrication	176
Hair guards	T212
Heat exchangers	93, 106
Hoists, cab-operated, electric	170b
Humidity control system	115
Indicators, thermometers, dial	138
Labels, heat seal, paper	32
Machinery design service	171
Magnets, permanent	TR214
Marking machines	B164
Materials of construction	
Stainless steel	24-25, 110, 166, 172-173, 192
Steel	T131
Meters, pH	25a
Mills, pellet	165
Mixing equipment	
Mixers	
Batch or continuous	157
Pan-type	122
Motors	
Electric	
a-c	12-13a
d-c	12-13b
Gear-motor	29
Gear, slow speed	20
Industrial	205
Explosion-proof	196
General line	4b
Motor controls	4d
Oils, compressor	216
Oils, edible	
Soybean cooking	23b
Soybean salad	23a
Packaging machines	
Automatic	
General line	153
Polyethylene packages	21
Bag, filling and closing	98b
Forming, filling and sealing	179
General line	30

ed a diaphragm valve
all the advantages
ragm closing



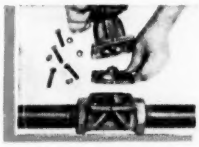
lar features of

DIAPHRAGM VALVES

working parts. Valve lubricant cannot contaminate the fluid in the line.

Diaphragm, body and lining materials to meet particular conditions . . . Bodies stocked in cast iron, malleable iron, stainless steel, bronze and aluminum: other materials on special orders. Valve bodies lined with lead, glass, natural rubber or neoprene. Diaphragm materials of natural rubber or synthetics. Working pressure, 150 lbs.; maximum temperature, 180 °F.

Diaphragm is only part that normally wears and needs replacement . . . Depending on the type of service, it may last for years, particularly since the compressor and finger plate combine to support the diaphragm in all positions. The diaphragm can be replaced quickly without removing valve from line. No refacing or reseating. No disc holder to require tightening or replacing. No packing glands to demand attention.



rs Diaphragm Valve Catalog 4-S.

RINNELL

te • Chicago • Cleveland • Cranston • Fresno • Kansas City • Houston • Long Beach
catello • Sacramento • St. Louis • St. Paul • San Francisco • Seattle • Spokane

e McGraw-Hill Publishing Co., Inc., Publisher, Wallace F. Traendly, N. Y. Subscription rates: United States and possessions, $3 for 1 yr.; payable in Canadian or U. S. funds; Pan American Countries, $5. 26, 1948, at Albany post office under Act of Mar. 3, 1879.

page

Wrappers, continuous B212
Wrapping, frozen food..... 95
Packaging materials
Cellophane 183
Glass 18-19b
Kraft paper and specialties.....215d
Polyethylene film 184
Wrappers, opaque diafane-coated 160
Pasteurizer jar cooler.....RB214
Peanut machines, catalog.....T146
Pipe
Stainless steel 186b
Steel, saran lined..... 158
Pumps, integral motor..... 4e

Recorders, temperature T137
Refrigerants, "freon" 201
Refrigeration equipment,
Automatic, complete installation 111b
Compressors,
Gas-engine driven 111a
General line B118
Steam-driven, ammonia 111c
Freezers, plate contact..... 136
Steam-driven, ammonia 111c
Storage coolers 34
Refrigeration systems, steam-jet vacuum 182

Scales
Specific weighing B137
Weighing, check 124
Scrubbers, fume 181a
Sheaves, grip 4a
Speed drives, adjustable.....12-13f
Speed reducers, worm gear..... 97
Speed variator 12-13d
Spray nozzles RT213, RT161
Sprockets 6b
Steam traps
General line B139
Thermostatic B118
Strainers 125
Sugar, liquid 204
Trailers, stainless steel..... 197

Trucks
Commercial 109, 142, 175, 206
Industrial
Auto-loader 180k

page

Cargo truck 180j
Fork, electric 116
Lift trucks capacity 2000 lb..180d
Lift trucks capacity 4000 lb..180a
Lift truck, capacity 7500 lb..180e
Lift trucks, capacity 15,000 lb. 180d
Mobile cranes 180f
Pallet truck 180g
Platform truck 180i
Straddle trucks, capacity 18,-000 lb. 180c
Straddle trucks, capacity 30,-000 lb. .....1801"ct"
Tug truck 180h
Tubing, stainless steel.....186a, 188

Unscrambling tables 154

Valves
Angle, bronze 173b
Diaphragm 2
Globe, bronze 178a
Lift check, steel.....107a
Precision made 177
Stainless steel 14
Steel 33
Valves; pipe and fittings.....107b
Vibrators, electric 155
Vats, vacuum process..... 167
Vitamins
A, natural 174a
A, synthetic 174b
Ascorbic acid 127e
Enrichment 120
Niacin 127d
Riboflavin 127c
Thiamine hydrochloride 127a
Thiamine mononitrate 127b

Washing equipment
Corn washer 108j
Ear corn brusher.....108f
Flood type washer.....108b
Rotary rod washer.....108i
Rotary washer 108e
Rotary wire cylinder washer...108h
Shaker fruit washer.....108d
Shaker washer 108a
Tank and jet spray washer.....108e
Whirlpool washer 108g
Wheels 123b, T126b

ADVERTISERS

For more data, circle number on postcard

page

Ajax Flexible Coupling Co., Inc.. 156
Allegheny Ludlum Steel Corp..... 110
Allis-Chalmers Mfg. Co..... 4
Aluminum Cooking Utensil Co..... 173
American Can Co..... 191
American Gas Association..... 119
Amerio Mfg. Co..... 136
Anchor Hocking Glass Corp.....18-19
Archer-Daniels-Midland Co..... 23
Armstrong Cork Co..... 113
Assembly Prod. Co., Inc..... 210

Bauer Brothers T146
Bemis Bro. Bag Co..... 98
Benj. C. Betner Co..... 199
Buschman Conveyors 94

Cambridge Wire Cloth Co..... 143
Carpenter Steel Co..... 186
Century Electric Co..... 20
Chain Belt Co..... 159
Chemsteel Construction Co., Inc.. 207
Cherry-Burrell Corp..... 34
Chester-Jensen Co..... 167
Chevrolet Motor Div., GMC..... 142
Chrysler Corp. (Dodge Div.)..... 206
Clark Equip. Co. Ind. Truck Div. 116
Colson Corporation T126
Container Corp. of America..... 101
Crane Co..... 107
Crown Can Co..... 198
Crown Cork & Steel Co..... 199
Crucible Steel Co. of America..... 199
Cyclone Fence Co.....T148

Darnell Corp. Ltd..... 123
DeLaval Separator Co..... 16
Detecto Scales Inc.....B137
Distillation Products, Inc.....100, 174
Dodge & Olcott Inc..... 163
Dow Chemical Co..... 158
Downington Iron Works..... 152
DuPont de Nemours & Co. Inc., E. I. 201
Dulien Steel 211

Electric Auto-Lite Co.....T137
Electric Storage Battery Co..... 189
Entoletler Div., Safety Car & Lighting Co., Inc. 157
Exact Weight Scale Co..... 124

First Machinery Co..... 210
Findley Co., F. G.....1213

page

Firmenich & Co..... 27
Food Machinery & Chemical Corp. 108
Frick Co. B148
Fruehauf Trailer Co..... 197
Fuller Brush Co..... 135

Gaylord Container Corp....3rd Cover
General Amer. Transp. Corp..... 10
General Biochemicals, Inc..... 207
General Electric Co.....12-17
Glycerine Producers Assoc..... 193
Gottscho, Adolph Inc.....B161
Griffith Laboratories Inc..... 15
Grinnell Co., Inc.....2nd Cover

Hamilton Copper & Brass Works, Inc. 96
Hapman-Conveyors, Inc. T118
Hoffman-LaRoche, Inc. 120
Howell Electric Motors Co..... 205
Hudson-Sharp Machine Co.....B212
Huron Milling Co.....RB161
Hyster Co. 130

Ingredients for Food Processor (Not Included in Reader Service) 207
Inland Steel Container Co..... 141
International Harvester Co..... 175
International Salt Co., Inc..... 168
Island Equipment Corp....154, LB214

Jamison Cold Storage Door Co.... 195
Jenkins Brothers 14

Koven & Bros. Inc., L. O..... 200

LaPorte Mat. & Mfg. Co.....B169
Lee Metal Products Co., Inc.....B126
Link-Belt Co. 6
Lukens Steel Co..... 171
Lunkenheimer Co..... 33

Manheim Mfg. & Belting Co..... 150
Master Electric Co..... 29
McGraw-Hill Book Co..... 151
Mears-Kane-Ofeldt B131
Merck & Co. Inc..... 127
Minneapolis-Honeywell Reg. Co. (Industrial Div.) 26
Monarch Mfg. Works. Inc.....L161
Monsanto Chemical Co..... 17

Nash Engineering Co..... 89
Nashau Gummed & Coated Paper Co. 32

Turn to next page

READER SERVICE POSTCARD

EDITORIAL ITEMS

Nº 4551

90A	96A	112D	118C	155I	156B				
90B	96B	112E	118D	155J	156C				
91A	96C	112F	118E	155K	156D				
91B	96D	115A	155A	155L	156E				
92A	98A	115B	155B	155M	156F				
92B	98B	115C	155C	155N	156G				
92C	98C	115D	155D	155O	156H	157C	157H	158B	158G
92D	98D	116A	155E	155P	156I	157D	157I	158C	158H
94A	98E	116B	155F	155Q	156J	157E	157J	158D	158I
94B	112A	118A	155G	155R	157A	157F	157K	158E	158J
95A	112B	118B	155H	156A	157B	157G	158A	158F	158K
95B	112C								

ADVERTISEMENTS

2	17f	94a	108h	123a	B137	155	170a	180k	201
4a	17g	94b	108i	123b	138	156	170b	180l	202
4b	18–19a	94c	108j	124	T139	157	171	181a	203
4c	18–19b	95	109	125	B139	158	172–173	181b	204
4d	18–19c	96	110	B126	140a	159	174a	182	205
6a	20	97	111a	T126a	140b	160	174b	183	206
6b	21	98a	111b	T126b	140c	LB161	175	184	T212
10	22a	98b	111c	127a	140d	RT161	176	185	B212
12–13a	22b	99	113	127b	141	162a	177	186a	L213
12–13b	23a	100a	114a	127c	142	162b	178a	186b	TR213
12–13c	23b	100b	114b	127d	143	162c	178b	188	TR214
12–13d	24–25	101	114c	127e	144	162d	179	189	BR214
12–13e	26	106	114d	128	T146	163a	180a	190	215a
12–13f	27	107a	115	T131	B146	163b	180b	191	215b
14	28	107b	116	B131	147	T164	180c	192	215c
15	29	108a	117	133a	T148	B164	180d	193	215d
16	30	108b	T118a	133b	B148	165	180e	194	216
17a	31	108c	T118b	133c	149	166	180f	195	
17b	32	108d	B118	133d	150	167	180g	196	
17c	33	108e	119	135	152	168	180h	197	
17d	34	108f	120	136	153	T169	180i	199	
17e	93	108g	122	T137	154	B169	180j	200	

OTHER REQUEST, OR COMMENT.....

.....

Name..... Position.....

Company .....

Address .....

Card Expires November 10, 1950

READER SERVICE POSTCARD

EDITORIAL ITEMS

Nº 4551

90A	96A	112D	118C	155I	156B				
90B	96B	112E	118D	155J	156C				
91A	96C	112F	118E	155K	156D				
91B	96D	115A	155A	155L	156E				
92A	98A	115B	155B	155M	156F				
92B	98B	115C	155C	155N	156G				
92C	98C	115D	155D	155O	156H	157C	157H	158B	158G
92D	98D	116A	155E	155P	156I	157D	157I	158C	158H
94A	98E	116B	155F	155Q	156J	157E	157J	158D	158I
94B	112A	118A	155G	155R	157A	157F	157K	158E	158J
95A	112B	118B	155H	156A	157B	157G	158A	158F	158K
95B	112C								

ADVERTISEMENTS

2	17f	94a	108h	123a	B137	155	170a	180k	201
4a	17g	94b	108i	123b	138	156	170b	180l	202
4b	18–19a	94c	108j	124	T139	157	171	181a	203
4c	18–19b	95	109	125	B139	158	172–173	181b	204
4d	18–19c	96	110	B126	140a	159	174a	182	205
6a	20	97	111a	T126a	140b	160	174b	183	206
6b	21	98a	111b	T126b	140c	LB161	175	184	T212
10	22a	98b	111c	127a	140d	RT161	176	185	B212
12–13a	22b	99	113	127b	141	162a	177	186a	L213
12–13b	23a	100a	114a	127c	142	162b	178a	186b	TR213
12–13c	23b	100b	114b	127d	143	162c	178b	188	TR214
12–13d	24–25	101	114c	127e	144	162d	179	189	BR214
12–13e	26	106	114d	128	T146	163a	180a	190	215a
12–13f	27	107a	115	T131	B146	163b	180b	191	215b
14	28	107b	116	B131	147	T164	180c	192	215c
15	29	108a	117	133a	T148	B164	180d	193	215d
16	30	108b	T118a	133b	B148	165	180e	194	216
17a	31	108c	T118b	133c	149	166	180f	195	
17b	32	108d	B118	133d	150	167	180g	196	
17c	33	108e	119	135	152	168	180h	197	
17d	34	108f	120	136	153	T169	180i	199	
17e	93	108g	122	T137	154	B169	180j	200	

OTHER REQUEST, OR COMMENT.....

.....

Address .....

Name..... Position.....

Company .....

Card Expires November 10, 1950

ADVERTISERS (Cont'd from 3rd page)

	page
National Starch	28
National Technical Laboratories	22
Nicholson Co., W. H.	B118
Norda Essential Oil & Chemical Co., Inc.	202
Nutritional Research Assoc.	207
Oakite Products, Inc.	140
Ohio Injector Co.	177
Package Machinery Co.	95
Pfaudler Co.	93
Philadelphia Gear Works Inc.	97
Pneumatic Scale Corp. Ltd.	30
Powers Regulator Co.	138
Preferred Utilities	194
Refined Syrups & Sugars Inc.	204
Refining Unincorporated	185
Regal Mfg. Co.	T212
Republic Steel Corp.	172, 173
Rheem Mfg. Co.	31
Riegel Paper Corp.	160
Rohm & Haas Co.	114
Ross Heater & Mfg. Co., Inc.	106
Ryerson & Son, J. T.	T131
Sarco Co., Inc.	B139
Schutte & Koerting Co.	181
Schutz-O'Neill Co.	T214
Shepard Niles Crane & Hoist Corp.	170
Sparkler Mfg. Co.	T169
Spraying Systems Co.	TR213
Sprout, Waldron & Co.	165
Standard Conveyor Co.	T139
Standard Oil Co.	176
Standard Steel Corp.	162
Standard-Knapp, Div. of Hartford Empire	153
Stephens-Adamson Mfg. Co.	190
Stokes and Smith	21
Surface Combustion Corp.	115
Sylvania Div., Amer. Viscose Corp.	183
Syntron Co.	155
Texas Co.	4th Cover
Transparent Wrap Machine Corp.	179
Trent Tube Co.	188
United Board and Carton Corp.	99
U. S. Cold Storage	B146
U. S. Steel	24-25, T148
Van Amerigen-Haebler, Inc.	117
Victor Balata & Textile Belting Co.	T164
Victor Chemical Works	144
Visking Corp.	184
Wallace & Tiernan Co., Inc.	147
Walworth Co.	178
Washington Steel Corp.	166
Westinghouse Electric Corp.	196, 203
Wheeler Mfg. Co., C. H.	182
White Motor Corp.	109
Worthington Pump & Machinery Corp.	122, 125, 111
Yarnall Waring Co.	125

SEARCHLIGHT SECTION (Classified Advertising)

EMPLOYMENT	
Positions Vacant	208
Selling Opportunities Offered	208
Positions Wanted	208
Selling Opportunities Wanted	208
Employment Services	208
EDUCATIONAL	
Schools	208
PROPERTY	
Wanted	208
EQUIPMENT (Used or Surplus New)	
For Sale	209-211
WANTED	
Miscellaneous	208
ADVERTISERS	
Albers Milling Co.	210
Allied Equipment Corp.	209
Assembly Prod. Co. Inc.	210
Brill Equipment Co.	209
Bucyrus Kettle Works, Inc.	210
Consolidated Products Co., Inc.	211
Drake Personnel Inc.	208
Dulien Steel Products, Inc.	210
Equipment Clearing House	209
Filter Paper Co., The	210
First Machinery Corp.	211
Gelb & Sons, Inc., R.	210
Jacobowitz Co., Charles S.	210
Kehoe Machinery Corp., Lester	209
Loeb Equipment Supply Co.	209
Machinery & Equipment Corp., The	211
Miami School for Processing Specialists	208
Mutual Spice Co.	211
Perry Equipment Corp.	211
Salvage Brothers Co.	211
Tomsett Associates	208
Union Standard Equipment Co.	209
Where To Buy	210

SALES REPRESENTATIVES

NEW YORK, 18, 330 West 42nd St. *C. C. Randolph, J. F. Juraschek*
Longacre 4-3000

BOSTON 16, 1427 Statler Bldg. *Hubbard* 2-4911 *W. Donald Boyd*
ATLANTA 2, 1311 Rhodes-Haverty Bldg. *Walnut* 5778 *Ralph Maultsby*
CLEVELAND 15, 1540 Hanna Bldg. *Superior* 7000 *Thomas E. Taylor*
DETROIT 26, 2980 Penobscot Bldg. *Woodward* 2-1793 *D. E. Sawyer*
CHICAGO 11, 530 N. Michigan Ave. *Whitehall* 4-7900 *David T. Kenney*
PHILADELPHIA 3, 17th & Samson Sts. *Rittenhouse* 6-0670 *Edward A. Martin*
DALLAS 1, Empire Bank Bldg. *Prospect* 7-5064 *J. H. Allen*
SAN FRANCISCO 4, 68 Post St. *J. W. Otterson, Ralph Dorland*
Douglas 22-4600
LOS ANGELES 17, 111 Wilshire Blvd. *C. W. Dysinger, H. L. Keeler*
Madison 6-4323

ST. LOUIS 8, Continental Bldg. *Lucas* 4867
PITTSBURGH 22, 7389 Oliver Bldg. *Atlantic* 4707

FOOD INDUSTRIES editorial and executive offices: McGraw-Hill Publishing Co., Inc., 330 West 42nd St., New York, 18, N. Y. James H. McGraw (1860-1948), Founder; Curtis W. McGraw, President; Willard Chevalier, Executive Vice-President; Joseph A. Gerardi, Vice-President and Treasurer; John J. Cooke, Secretary; Paul Montgomery, Senior Vice-President, Publications Division; Ralph B. Smith, Editorial Director; Nelson Bond, Vice-President and Director of Advertising. Cable address: "McGraw-Hill, N. Y." Address correspondence regarding subscriptions to J. E. Blackburn, Jr., Vice-President and Director of Circulation. Member A.B.P. and A.B.C. Indexed monthly in Industrial Arts Index.

Copyright 1950, by McGraw-Hill Publishing Co., Inc. All rights reserved.

Postage Will be Paid by McGraw-Hill Pub. Co.

BUSINESS REPLY CARD
First Class Permit No. 64, (Sec. 34.9, P. L. & R.) New York, N. Y.

FOOD INDUSTRIES
330 West 42nd Street
New York 18, N. Y.

No Postage Stamp Necessary if Mailed in the United States

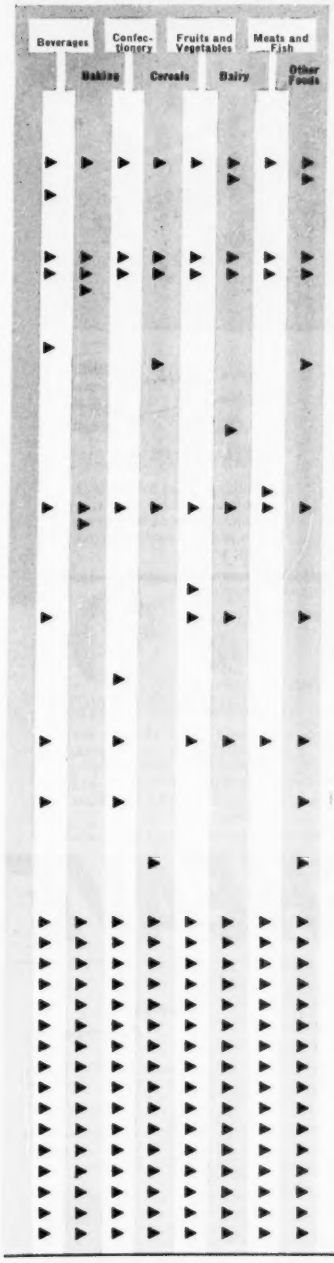
Postage Will be Paid by McGraw-Hill Pub. Co.

BUSINESS REPLY CARD
First Class Permit No. 64, (Sec. 34.9, P. L. & R.) New York, N. Y.

FOOD INDUSTRIES
330 West 42nd Street
New York 18, N. Y.

No Postage Stamp Necessary if Mailed in the United States

INDUSTRY INDEX



Food Industries

AUGUST, 1950 • VOL. 22, NO. 8

SPECIAL FEATURES

What Preparedness Program Means to Food Processors..F. K. Lawler 35
Made-To-Order Infant Formulas.....C. R. Havighorst 40
They Channel Labor Saving Into Quality.....A. V. Gemmill 52

MANAGEMENT

But What Do the *Consumers* Say?.....George Garnatz 36
Court Decisions Give Tips on Avoiding Legal Tangles....Leo T. Parker 42
Modernizes Management and Processing.....R. E. Chivers 72

PACKAGING

New Concept in Beer Can Label..... 45
New Drive Doubles Auger-Filler's Range.....Ivan C. Miller 49

RESEARCH

What Military Wants in Milk Products.....Amandus J. Boyer 46

EQUIPMENT

Doubles Volume With Hoist and Pump Rig.....John V. Ziemba 50
No Foothold for Fire On This Line.....W. E. Morgan, Jr. 71
Down Go Pie-Plate Handling Costs..... 84

ENGINEERING

Report New Technical Strides In Design of FCC Evaporator
C. D. Atkins, *et al* 56
How to Improve Your Flat-Top Conveyors.....W. A. Reed 57

FOOD INDUSTRIES REPORT

Cold Stored Candies.....J. G. Woodroof, *et al* 59

DISTRIBUTION

Truck Speeds Can't Faze New Cooling Unit..... 76

QUALITY CONTROL

Five Keys to Growing Nutritional Yeast.....C. H. Keipper 78

FI PICTURE-FLOWSHEET

Starch, Oil and Feed From Sorghum Grains..... 102

EVERY MONTH

Highlights—*At-a-glance roundup of things outstanding*..... 5
Talk of the Industry—*Topics of conversation among food men*..... 7
Hors d'Oeuvres—*Quips that make pertinent points*..... 7
FI Index and Outlook—*Production trends for 12 basic products*..... 8
What Washington Thinks—*Interpretive comments from the Capital*.... 11
Editorials—*Opinions and comments on current problems*.....35 and 85
Practical Ideas—*Devices and methods that can be put to work*..... 87
Food Equipment News—*Machines to cut costs, boost output*..... 90
New Packages and Products—*Innovations in foods and containers*.... 112
New Technology—*Advances reported in technical abstracts*..... 121
Food Industry News—*Roundup of recent developments*..... 129
Changes in Food Supplies—*Data on output, materials storage*..... 143
Men, Jobs and Companies—*A spotlight on firms and personalities*..... 145
Books—*What's new for the food plant bookshelf*..... 151
Catalogs and Bulletins—*Literature on equipment and supplies*..... 155
Patents—*New machines and processes developed by inventors*..... 161

PUBLISHER, Wallace F. Traendly — EDITOR, Frank K. Lawler — EDITORIAL DIRECTOR, Sidney D. Kirkpatrick

ASSOCIATE EDITOR E. S. Stateler, Chicago
ASSOCIATE EDITOR C. R. Havighorst, San Francisco
ASSOCIATE EDITOR.....J. A. J. Jones
MANAGING EDITOR.....Herb Powell
ASSISTANT EDITOR.....A. V. Gemmill
ASSISTANT EDITOR...John V. Ziemba
ASSISTANT EDITOR...F. W. McCarthy
ART EDITOR.....Priscilla A. Truax
CONSULTING EDITORS: Laurence V. Burton, R. S. McBride
WASHINGTON OFFICE.G. B. Bryant, Jr.
WORLD NEWS DIRECTOR Russell F. Anderson
DIRECTOR ECONOMICS BOARD Dexter M. Keezer
SALES MANAGER..Grahame E. Riddell

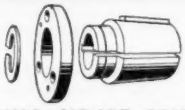
4 BIG ADVANTAGES!

ONE PIECE MOUNTING

Bushing and sheave go on together. One motion mounting. Alignment is easier. Sheave is on right first time.

POSITIVE DRIVE

Bushing is keyed to both shaft and sheave. No slipping. No sheared screws. No jammed bushings from bent screws.



FULL CIRCLE GRIP

Bushing split full length with separate collar. Grips shaft full length around full diameter. No forcing or distortion. Grip easily broken. No hammering.

WIDE SIZE RANGE

Magic Grip sheaves are available from 3" pitch diameter up. Style NC bushing for smaller sizes and Style C bushing for larger sizes.

MAGIC GRIP SHEAVE

YOU CAN MOUNT a *Magic Grip* sheave faster than any other sheave you can buy . . . and demount it just as fast. When you mount a *Magic Grip* sheave it runs true. It will not slip or jam. It always comes off easily.

Even if you don't change sheaves often, you should have *Magic Grip* sheaves on every drive to eliminate the possibility of shaft and bearing damage when ordinary sheaves are hammered or pried on or off.

WIDEST V-BELT LINE

Get everything you need for your V-belt drives from one reliable source. *Texrope* offers the broadest line of V-belts, standard and variable speed sheaves and speed changers in the industry. And you also get the extra engineering skill that comes from having more industrial V-belt installations than any other manufacturer.

Get your copy of the 144 page *Texrope* Pre-Engineered Drive Manual from your A-C Authorized Dealer or Sales Office or write for Bulletin 20B6956.

A-3022

ALLIS-CHALMERS, 1113A SO. 70 ST.
MILWAUKEE, WIS.

Texrope and *Magic Grip* are Allis-Chalmers trademarks.

Sold . . .
Applied . . .
Serviced . . .

by Allis-Chalmers Authorized Dealers, Certified Service Shops and Sales Offices throughout the country.

MOTORS — ½ to 25,000 hp and up. All types.

CONTROL — Manual, magnetic and combination starters; push button stations and components for complete control systems.

PUMPS — Integral motor and coupled types from ¾ in. to 72 in. discharge and up.

ALLIS-CHALMERS

HIGHLIGHTS

Recent National Labor Relations Board decisions are seen as indicating approval of industry's stand against companywide bargaining. In denying two petitions made by General Baking employee groups, the Board indicates a favorable attitude toward areawide negotiations. Bakery & Confectionery Workers petition for companywide bargaining in the General Baking case is still pending. (See News)

Of the money spent for vegetables by urban families, 70 percent went for the fresh variety, 25 percent for canned and 5 percent for frozen. This was disclosed by a survey made in the spring of 1948 and just released by the Agricultural Research Administration of USDA. So there is still no lack of room for expansion in the vegetable processing fields.

California scientists urge caution in the use of antibiotics in poultry feeds. Too little is known, as yet, concerning their action to rule out certain potential hazards both for the poultry industry and in human feeding. But further research promises to clear up all uncertainties. (See News)

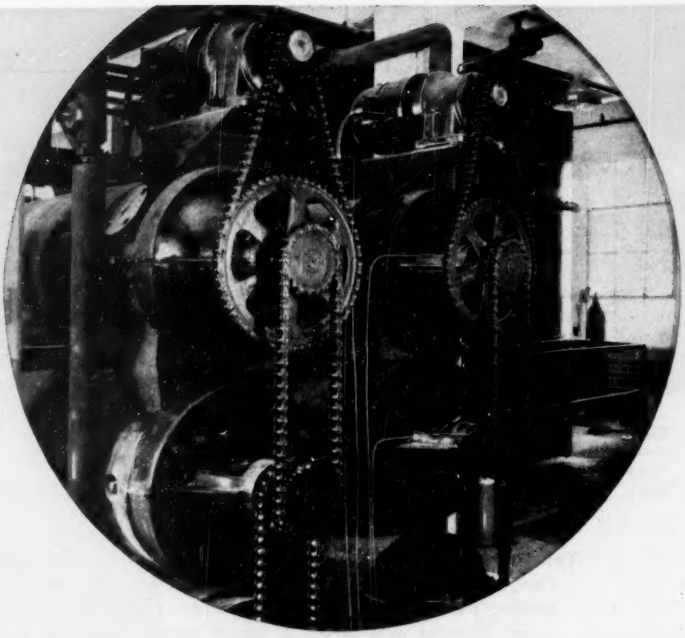
Two new and likely popular foods have recently emerged from college laboratories. Oregon State College experiment station came up with a frozen fruit puree dessert that retains the natural flavor of the fresh fruit. Most pleasing to date is a boysenberry puree blended with apple or peach puree. Texas A. & M. has developed a "Popsorghum" that samplers have liked as well as popcorn. Its smaller size—15 to 1 expansion—makes it just right for packaged caramel and candied confections. (See News)

Processing of infant formulas, individually compounded from doctors' prescriptions, has been put on a profitable commercial basis by Baby Formulas of San Francisco. Although on a small scale, the operation parallels that found in the large, long established food processing plant. With production now reaching 6,000 bottles of formula a day, the company estimates its products feed one-third of all infants born in the San Francisco Bay region. This looks like a fine idea for enterprising food men elsewhere. (See Article)

Florida citrus canners gird for long court battle over the recently enacted "Florida Citrus Code." The canners, backed by the National Canners Assn., see in this legislation a regulatory threat to the whole food processing industry and are prepared to carry the fight to the U. S. Supreme Court, if necessary. The industry will keep an eye on this case.

With corn and wheat crops higher than expected and soybeans heading for a record total, grain processors and cattle feeders have regained their cheerful outlook. July 1 estimates place the corn crop at 3,176,000,000 bu., an indication that planters ignored the government recommendation to cut 20 percent. Combined winter and spring wheat should reach 960,000,000 bu., and soybeans, 285,000,000 bu., which will offset the small cottonseed crop. But it won't be too much if the Reds launch any more "peace" moves.

An estimated 80 percent reduction in man-hours is credited to a newly developed automatic "pallet packer." Used in packing bulk chocolates, the unit has a continuous feeder belt leading to the packing table from the point where the chocolates leave the cooler after being coated. Chocolates are automatically deposited on cardboards, enabling packer to pick up 40 pieces at a time to be placed in stock boxes. And this is an area where cost cutting really counts. (See Equipment)



Link-Belt Precision Steel Roller Chains and Sprockets assure positive transmission of power for efficient operation of these French Oil Mill Machy. Corp.'s soybean meal conditioners. Power is supplied by Link-Belt gearmotors.

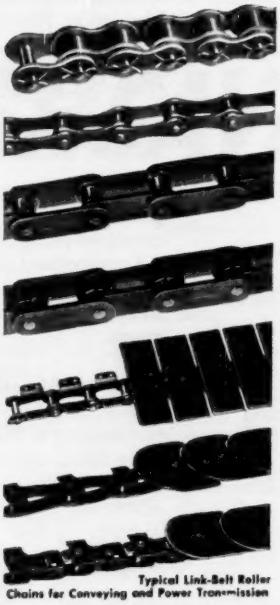
there's never a slip

with a LINK-BELT GRIP

Positive transmission of power and efficient conveying with compactness, wide flexibility of arrangement and ability to absorb shock are characteristics of roller chain, which are enhanced by the precision manufacturing methods and metallurgical control followed in the huge Link-Belt chain plant.

Link-Belt Precision Steel Roller Chain and Sprockets are available immediately, in single or multiple widths, in ⅜" to 2½" pitch. Also, with various types of attachments, as well as the double pitch and flat-top, crescent flat-top and universal flat-top chains. Made to manufacturers' A.S.A. standards.

12.017-B



Typical Link-Belt Roller Chains for Conveying and Power Transmission

LINK-BELT
PRECISION STEEL
ROLLER CHAINS
AND SPROCKETS

THE SYMBOL OF QUALITY — LB — LINK-BELT

LINK-BELT COMPANY

Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Johannesburg. Offices, Factory Branch Stores and Distributors in Principal Cities.

The Talk of the Industry

Nonfrozen Concentrated Milk?

Concentrated fresh milk not only is technically feasible, but it offers great opportunity to reduce shipping costs. That is the opinion of an experienced dairy chemist—but he is thinking of nonfrozen concentrated milk.

Cream is concentrated successfully—why not milk? A little bottle of it would make a quart after the consumer added water. Concentration could be done in the milk-producing area to reduce freight to the market. And three times as much could be hauled by the milk delivery truck. Quick delivery would avoid need for keeping-quality.

There are some practical problems, but the idea is intriguing.

Incidentally, it's an even bet that nearly all fluid foods eventually will be concentrated.

Better Join the Party

To capitalize on the impressive increase in home entertaining brought about by television, the baking industry and Doughnut Corp. of America are putting on a big party-theme doughnut promotional campaign. Seems that 600 million parties were given in 1949, at an estimated cost of $2,500,000. And handy snacks came in for a sizable slice of the expenditures.

Wouldn't be surprised if other food processors crash the doughnut parties.

"Hot" Harpoon Kills Whales

Britain's famous floating whale factory, the *Balaena*, has successfully used an electrified harpoon to kill whales on the high seas. The harpoon line is an electrical conductor connected to a power source aboard the ship.

This instrument of sudden death saves time in landing the whale. What's more, it eliminates some unhealthy hazards. Shades of Moby Dick!

They Butter Not Eat Oleo

"Butter Substitutes Served and Used Here." That sign, in big letters, must be conspicuously displayed in eating places serving margarine in the state of Washington. And it must appear prominently on menus, too. Seems that the margarine industry still has a few battles to fight.

Another interesting angle on the sale of margarine is suggested by a Chicago newspaper. It predicts that the people in Illinois, and in other states which ban yellow margarine, will run the blockade by purchasing from mail-order firms. We wouldn't be surprised. People often resort to shenanigans to obtain things which pressure groups have denied them.

Radioactive Greenhouse Built

To most food processors, atomic energy connotes a quick way of erasing cities from the map. But it may mean something in a constructive peaceful sense in the not too distant future.

The Atomic Energy Commission and the U. S. Department of Agriculture have announced completion of a specially designed greenhouse, at Beltsville, Md., for the use of radioactive isotopes in research. Plant physiology, soil biochemistry, and fertilizers will be studied.

Out of this might well come greater production of better quality raw foods, as well as new knowledge which has a bearing on processing and nutrition.

Horses Prefer White Bread, Too

Stale bread returns are disposed of in a unique manner by Fuchs Bakery, South Miami, Fla. Bread picked up from retail stores is fed to horses on a registered stock farm owned by the Fuchs family.

The horses do very well on this feed, thank you. They prefer the bread to oats and, like people, want white bread instead of whole wheat or rye.

The animals are fed nothing except the bread and the grass they eat on pastures. One of the horses is seven years old, has existed entirely on a bread and grass diet, and is in excellent condition.

Lest we mislead you, Fuchs does not just horse around with the stale returns problem, but makes a fetish of keeping such returns at a minimum.

Borden's $8,000 Typewriter

By dividing its $252 million of assets by the number of its employees—31,166—Borden finds that it has invested $8,000 to give each worker a job. Even the girl running a typewriter has this much money behind her, for there would be no work for the typewriter were it not for the more costly plant and distribution equipment.

This is a point worth making to your employees.

Hors d'Oeuvres

■ Doughnut consumption in 1949 was approximately 12,000,000,000, according to Bakers of America and Doughnut Corp. Consumption in the first five months of this year was 5,580,000,000 give or take a half dozen. Certainly looks like an increase. Thing is, with coffee prices so high people just can't afford to dunk only one doughnut per cup.

■ USDA researchers are caging bumblebees for experiments on crop pollination. Since a colony of 40 to 50 is the rule with bumblebees, there is no trouble. Couldn't do it with honey bees, though. They come in lots up to 60,000. Just shows you the more there are the greater the freedom, and vice versa.

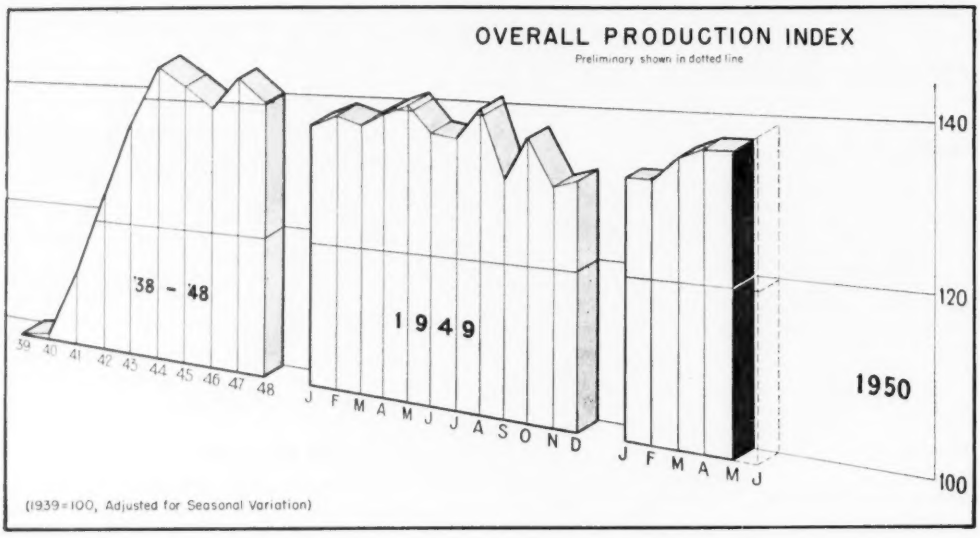
■ Your retail customers are being threatened with electronically controlled recorders that give a sales message as the victim passes the display. Runs six to ten seconds—which is going to remind a lot of us that six to ten seconds can be a very long time.

■ "Bugs, drought and Senators delay start of 1950 price supports," says the *Wall St. Journal*. And we can see no excuse for the bugs and drought—they aren't scratching for November votes.

■ California taxers are considering imposition of their sales tax on the skins of skinless hot dogs. Cellulose wrappings are involved, but how they arrive at the tax angle is strictly Pacific.

J.A.J.J.

FI Index and Outlook


OVERALL PRODUCTION INDEX
Preliminary shown in dotted line
'38 - '48
39 40 41 42 43 44 45 46 47 48
1949
J F M A M J J A S O N D
1950
J F M A M J
140
120
100
(1939=100, Adjusted for Seasonal Variation)

Food Production Reaches '50 Peak As Consumer Buying Stays Strong

Output at loftiest level since last August. And threat of wartime conditions is seen upping demand

PROCESSING activity in June reached the highest point in almost a year—139 on the index—up from the revised May figure of 137. The increased action in the food field is in pace with the general up-swing in business and can be attributed to the persistent strength of consumer buying.

It is still too early to tell how far this rise is production will carry. A short time ago, it appeared that June would see the current peak for the index, and that then the activity would show a less than seasonal gain during the remainder of the summer. This still seems likely to be true in the canning and freezing field. However, demand for other foods has been strengthened by the possibility of a return to wartime conditions. And overall production consequently may hold up better than expected earlier.

Crops and Korea

The impact of hostilities in the Pacific was felt immediately in the food processing field. Inventory building—already noticeable in the second quarter—has been given a new impetus by rising prices. Meat, flour, sugar and shortening, for example, were quoted higher soon after the outbreak of fighting. In the face of these developments, distributors seem likely to pursue an aggressive inventory policy in coming months, putting a strong demand on the processors.

Fortunately, crop prospects have improved at the same time. There will be shortages of some fruits and vegetables for packing. But prospective supplies of wheat, sugar and vegetable oils have increased. Most importantly, the supply of feed grains will be very large. This virtually assures continued heavy production of meat and dairy products not only for the rest of 1950, but probably well into 1951. The combination of growing demand and better crops should mean high level activity in most processing lines.

Dairy Products Still Surplus

Continuing to run ahead of consumption is dairy production. It is possible that this year may show the greatest milk flow on record, and virtually certain that it will top 1949. Milk production for the first six months of 1950 was 2.5 percent above last year. Despite poor pasture conditions during May, production in the second quarter reached an annual rate of 120.7 billion pounds, compared with the 1949 final total of 119.1. The first quarter saw an even higher rate: 123.1 billion pounds per year.

Fluid milk sales have risen slightly, absorbing about half the total gain in milk production. This improvement is probably the result of normal population growth combined with a 6 percent fall in retail price, rather than a permanent increase in per capita consumption. Despite reductions, price continues to limit consumption in some areas.

At a Glance—

(1939 = 100, with all figures adjusted for seasonal variations.)

	May 1950	Apr. 1950	Percent Change	Year Ago
Baking	127	128	−1	126
Butter	80	84	−5	82
Canning	153	147	+4	168
Cheese	156	170	−8	169
Confectionery	128	125	+2	127
Evap. Milk	123	122	+1	128
Flour	115	116	−1	113
Ice Cream	183	160	+14	187
Malt Liquors	172	177	−3	179
Margarine	225	229	−2	252
Meat Products	150	149	+1	145
Sugar	111	105	+6	101

This price obstacle stands in the way of further sales increases. Costs to producers are running higher than a year ago. The milk-feed ratio is below the 20-year average. And farm wage rates are rising again after a drop last fall. These rising costs will prevent further retail price reductions. And without such cuts, it is unlikely that fluid milk sales can absorb much more of the milk flow.

Most of the resulting excess milk will go into butter. Here, output was down in May. But the four-month total for 1950 was up 4 percent from last year, and if the milk flow continues high as expected, the nation should produce about 100 million pounds more butter than last year's 1,409 million. A similar rise may be expected in cheese production. Output of American cheese fell in April and May due largely to the late milk flush. But it was probably up contra-seasonally in June and should gain from now on. Along with butter and cheese, the industry is turning out large quantities of non-fat dry milk solids. Production of both evaporated milk and ice cream has dropped recently after starting the year well above 1949. True, ice cream did snap back in the latest month reported, but output could decline later this year, since ice cream is not on the government support program.

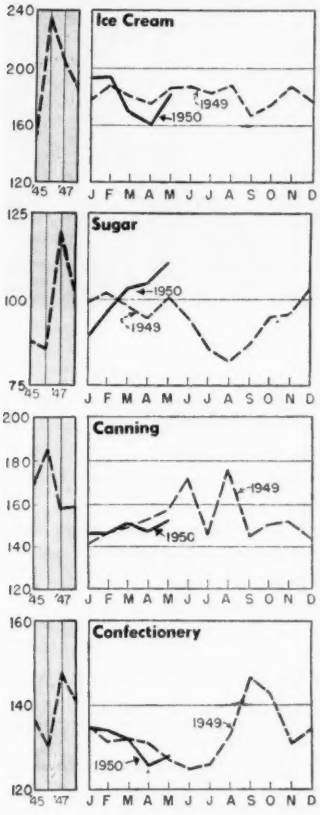
Government Buying Increases

Price support purchases provide the only outlet for increased production of butter, cheese and non-fat dry milk solids. Failure of consumption to keep pace with output has already boosted private holdings of butter and cheese. And there is no reason for producers to carry even higher inventories. It is now estimated that consumption needs for the rest of 1950 can be met out of current output, even during the winter period of reduced milk flow. So any further accumulation during the peak production season will pass into government hands.

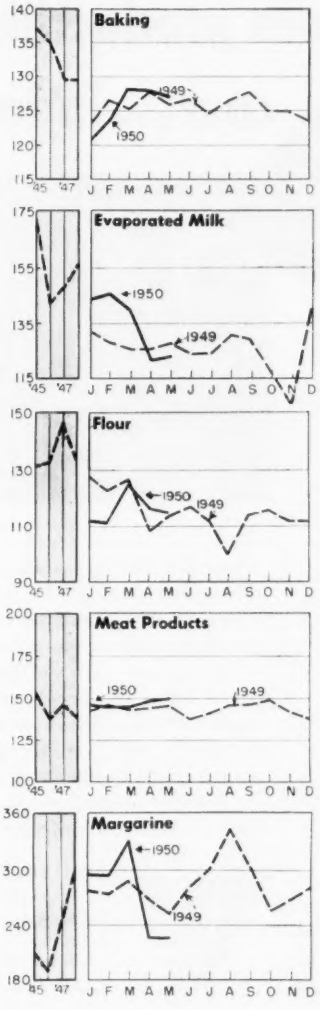
Large quantities of dairy products have already been purchased this year under the support program. Through May 31, purchases of non-fat dry milk solids totaled 193,485,000 lb.—up 18 percent from 1949. This figure represents fully 45 percent of all production during the period. Butter was purchased at the rate of between 9 and 10 million pounds per week in early June. And government holdings of this spread now are equal to more than six weeks production by all the nation's creameries combined.

Schemes will certainly be proposed to get rid of this surplus (it has proved impossible to do so in the export market). But no early action is likely. Present support prices are mandatory until March, 1951. Thereafter, the Secretary of Agriculture may, at his discretion, reduce the support price from the present 79 percent of parity to 75 percent of parity. However, parity will probably be higher because of rising farm costs. So the 1951 support price may be little lower than currently. Unless there is an unexpected further rise in the costs of dairying, milk and butter production will therefore continue near the present high level through 1951.

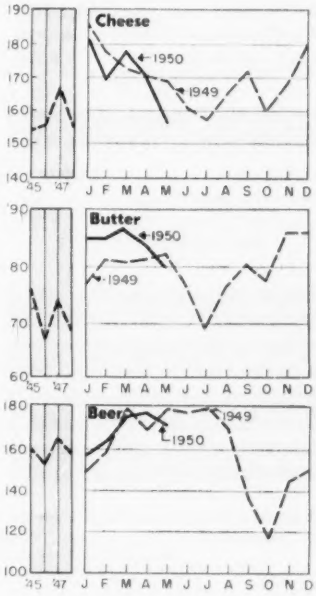
RISING ▲



STEADY →



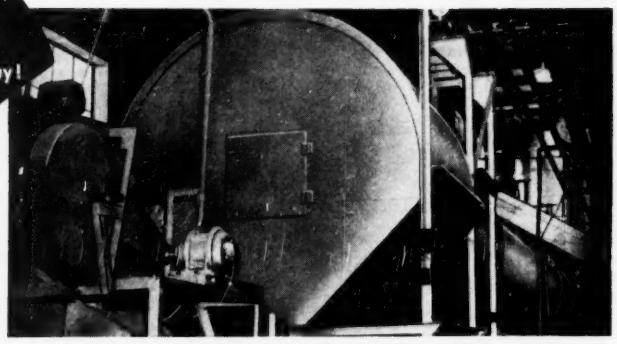
FALLING ▼



See Louisville for
CREATIVE
DRYING
ENGINEERING

New Louisville "Job Designed" Dryer gives 50% more production... at lower cost... in less space

KNOW THE
RESULTS
Before You Buy!



FORMER DRYER

Installed cost	$60,000
Annual production (tons)	6,000
Drying cost per ton	4.65

(space required, 2500 sq. ft.)

LOUISVILLE DRYER

Installed cost	$15,000
Annual production (tons)	9,000
Drying cost per ton	1.15

(space required, 1000 sq. ft.)

YEARLY SAVINGS of LOUISVILLE DRYER in OPERATING COSTS ALONE $21,000

Other General American Equipment:
Turbo-Mixers, Evaporators, Thickeners, Dewaterers, Towers, Tanks, Bins, Filters, Kilns, Pressure Vessels

When production costs are eating up profits, here's something worth looking into. This food processor was using a large, costly installation for drying until he asked a Louisville engineer to survey his production.

A dryer was designed specifically for his operations. Its performance was pre-determined in our own unique research laboratories and pilot plant. *The new dryer turns out better, more valuable production in less space—with great savings in annual operations.*

Without obligation ask a Louisville engineer to survey your drying methods.

PROCESS EQUIPMENT DIVISION
GENERAL AMERICAN
TRADE MARK

Louisville Drying Machinery Unit
Over 50 years of creative drying engineering
GENERAL AMERICAN TRANSPORTATION CORPORATION
Dryer Sales Office: Hoffman Bldg., 139 So. Fourth Street
Louisville 2, Kentucky
General Offices: 135 South La Salle Street, Chicago 90, Illinois
Offices in all principal cities

What Washington Thinks

LINDANE SAFE—Recommendations of the Department of Agriculture for use of lindane in dairy barns and on dairy cows are for two purposes only, as of May 1950: Mange control and lice control. "At the present time, lindane is not recommended for controlling other external parasites of dairy cows," and this includes flies and ticks, among others. The distinction is that lindane treatment for mange and lice involves only small amounts applied not more than twice. Small amounts of lindane appear in the milk thereafter, but its presence is of short duration and little or none of the chemical can be detected after the third day. With such limited use, USDA and Food & Drug Administration agree that negligible health hazard to the consumer would be created.

PROCESSING COSTS—Cottonseed processing mills have very wide variations in operating practices and costs. In most of the cost categories "there are some mills whose costs are more than double those of other mills," according to the recently completed PMA study with Research & Marketing Act funds. Those who wish a copy of the complete report, "Distribution of Marketing and Processing Costs of Cottonseed-Oil Mills, 1947-48," should write Information Branch of PMA, U. S. Department of Agriculture, Washington 25, D. C. Among other conclusions that the reader will find are these: "Most frequently the reason for high total costs is that one cost, or a very few, is out of control . . . To maintain low costs, all items must be watched and held low together."

LATIN TECHNICS—Flour mills, bakeries, and other grain processing facilities in Latin America are being visited now as part of a Department of Agriculture study of the grain marketing situation. Henry A. Baehr, marketing specialist and cereal chemist, is conducting the study as a Research & Marketing Act project. His trip was scheduled for mid-June to mid-October and will, it is hoped, determine just how U. S. producers and processors can best supply markets in Latin American areas.

PREPACKAGING ECONOMICAL—Cranberries have been prepackaged in consumer-sized cellophane bags for "very little more" than it formerly cost for the old-fashioned quarter-barrel wooden boxes. In view of the fact that three quarters of the 1949-50 crop sold fresh was so prepacked, it is not difficult to believe that the increased cost was slight. The packages may be bought ready-made, or they may be made and filled at the plant on special bag-making equipment. Details of this study, which may be of interest to other food packagers, will be found in the Farm Credit Administration's Miscellaneous Report 138.

BEE REFINED—Dark or strong-flavored honey can be refined simply by new methods developed at the Eastern Regional Research Laboratory near Philadelphia. Bentonite or charcoal can be used to produce a mild or a completely deflavored honey, just as wholesome, nutritious, and sweet as the original honey, but without the strong flavor. Purpose of this technologic attack on low-grade honey is to salvage for the food industry the 3 to 5 percent of honey now marketed with difficulty because of its dark color and strong flavor. Manufacturers of confectionery, bakery products, and other foods should find at least the charcoal-treated (deflavored) honey useful, even though it is not intended for direct consumer use as is the bentonite-treated product.

MOLD CONTROL—Many vegetable containers rapidly get moldy under ordinary conditions. Western Regional Research Laboratory has made a study of some of the wax treatments of such containers to see whether the result will not be a resistance to mold. Certain of the results are quite encouraging. They are intended to apply directly to such things as berry boxes; but it looks as though some of the results might be useful also for processed food containers. If interested, write to the Bureau of Agricultural & Industrial Chemistry at Albany, Calif., and ask for AIC-270.

FAT MARKETS STUDIED—Production & Marketing Administration is making arrangements for a private industrial consultant of New York City "to study existing and potential market outlets for fats and oils of domestic agricultural origin." PMA explains the plan as follows: "Since the war, consumption of domestic fats and oils has not kept pace with the increased supply. This research is designed to discover or develop additional market outlets for the large supply. The major emphasis of the study will be on inedible fats and oils." The research was initiated following recommendations of the commodity advisory committees established under the Research & Marketing Act of 1946.

BOTH WATER AND AIR—Food industries are confronted with the necessity of protecting not only the streams but also the atmosphere around their plants. The federal government has spotlighted the air-pollution program by a technical conference sponsored by an Interdepartmental Committee on Air Pollution. The stream pollution problem has been getting most attention. But there is no doubt that comparable consideration will soon be given to the fumes, and dust, and other air contaminants that escape from our factories. One should not be an alarmist on these questions. But they are real. And if neglected, they will become serious to the individual company or to whole industries.

"DISPOSAL A PROBLEM" — For price support of agricultural commodities, Uncle Sam has spent nearly $2,000,000,000 and loaned as much more. Now he is having trouble in selling or releasing these goods without breaking the market price badly. Commodity Credit Corporation does not like to admit how difficult the problem has become, but a recent document showed how concerned the Department of Agriculture has become. It describes the situation in a conspicuous headline in these words, "Disposal a Problem as C. C. C. Holdings Increase."

PARTICIPATION NECESSARY — Investigation is continuing in Food & Drug Administration of the hazard involved when any particular chemical forms a residue on food upon which it has been sprayed for pest control. A large number of chemicals is being considered. There are probably other chemicals that should be discussed and made a part of the record of F&DA. Any company interested in such a chemical should promptly arrange to have this item made a part of the investigation before it is too late. It is not safe to assume that commodities not considered will not later be forbidden to appear in foods as spray residues.

—R. S. McBride, Washington, D. C.

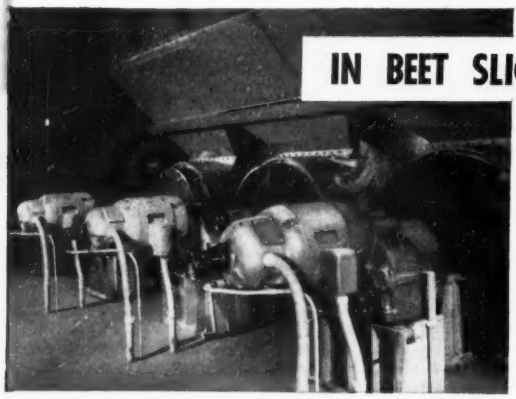
how 3 food plants cut costs with G-E adjustable-speed drives

You, too, can get more out of your machines with the right adjustable-speed drive from the complete G-E line!

Here are just three food processors who turned some perplexing problems into profitable production by coming to General Electric —headquarters for electric adjustable-speed drives. And here's the moral:

To meet *your* specific needs, General Electric recommends only the *right* adjustable-speed drive. Here is the broadest line of its kind—*sure* source for the *right* speed for *every* job!

A G-E food industry specialist will gladly help you apply adjustable-speed to get more out of your machines. Call him at your nearest G-E office, or send the coupon for more data. *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*

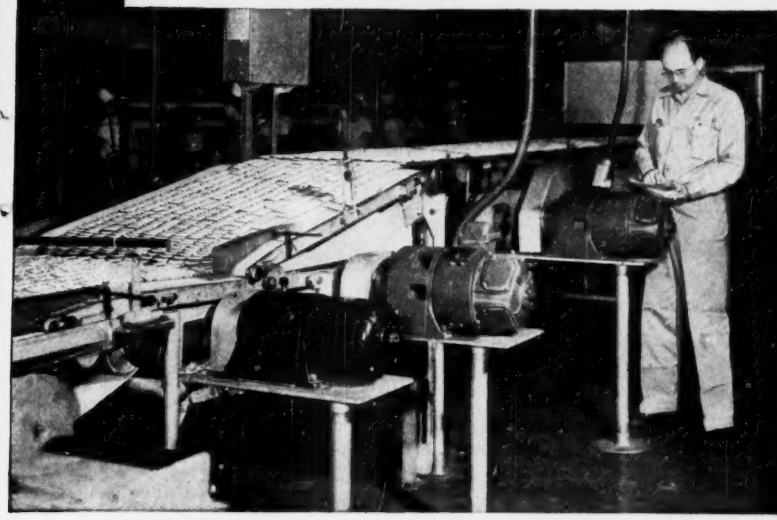


IN BEET SLICING —OUTPUT KEPT HIGH!

One of the nation's largest beet sugar factories—the Moorhead, Minn. plant of the American Crystal Sugar Co.—uses these three G-E Tri-Clad ® 50-hp wound-rotor a-c motors to provide adjustable speed in slicing beets. Individually controlled, they drive the beet-slicers at most efficient speeds for an average output of 50 tons per hour each. G-E wound-rotor motors are a low-cost choice for simpler jobs where limited speed adjustment and wide speed regulation are permissible. Also available are G-E adjustable-speed d-c motors for food plants already equipped with a d-c distribution system.

GENERAL ELECTRIC

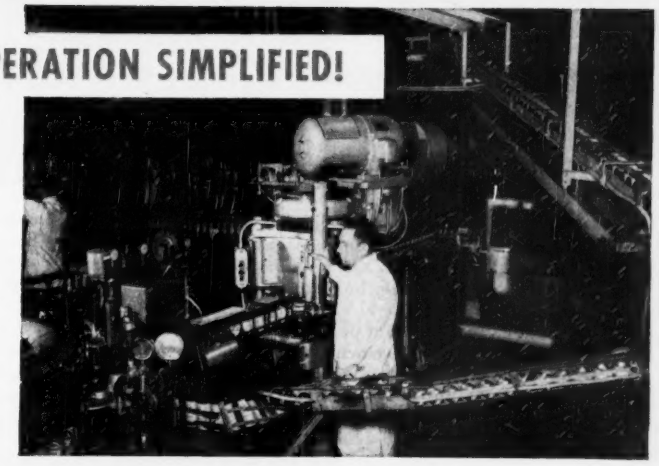
IN BISCUIT BAKING—PRECISION CONTROL ASSURED!



On a 600-foot continuous biscuit-production line at the Keebler-Weyl Baking Co. of Philadelphia, 26 G-E Thy-mo-trol® drives closely co-ordinate individual machine speeds. Rated ½ to 7½ hp, they keep the entire line in step, and help maintain plant cleanliness. In addition to ultra-accurate and versatile Thy-mo-trol, G-E packaged adjustable-speed drives also include speed variators and electronic speed variators.

IN BEER CANNING—OPERATION SIMPLIFIED!

"Make Mine Ruppert" and "Make Mine ACA" are synonymous slogans at the Jacob Ruppert Brewery in New York, where a conveyor system to process cans through filling and capping machines is driven by a 10-hp G-E Tri-Clad ACA motor. To vary output from 105 to 315 cans per minute — formerly done by manually adjusting a belt — finger-tip dialing now produces instant speed changes. Operating on a-c power without conversion equipment, ACA motors give stepless speed control over ranges up to 20 to 1, in ratings from 3 to 75 hp. Also available, in ratings from 1 to 15 hp and up, are ACA gear-motors for low adjustable speeds.

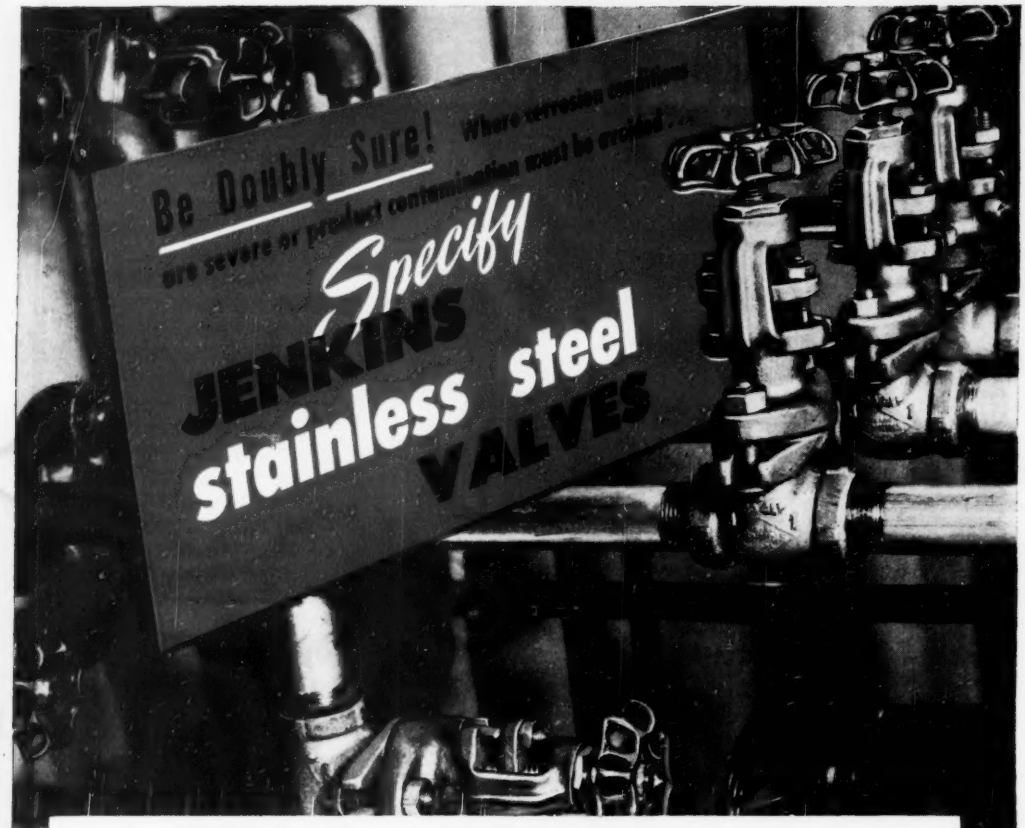


WANT MORE DATA?

General Electric Company, Section 652-6
Apparatus Department, Schenectady 5, N. Y.
Please send me the following bulletins:
(√) for reference purposes
(x) in connection with immediate project

( ) GEA-4883—ACA Motor
( ) GEA-5334—Adjustable-speed manual
( ) GEA-5335—Speed Variator
( ) GEA-5336—Electronic Speed Variator
( ) GEA-5337—Thy-mo-trol Drive

NAME_____
COMPANY_____
STREET_____
CITY_____ STATE_____



In plants handling corrosive liquids, or fluids that must be kept free from contamination or discoloration, Stainless Steel Valves must be not only the right *type*, but fabricated of the *proper* alloy for the service.

To keep production at peak, and down-time for repairs and replacements to a minimum, alert management chooses Jenkins Stainless Steel Valves. Built to the same quality standard which has made "Jenkins" the preferred industrial valve, Jenkins Stainless Steel Valves are available in a range of sizes to meet almost any service requirement.

Equally important, however, is Jenkins Engineering Service. Providing information you need to select the alloy or type of valve which will render the best service (based on analysis of specific information about the valve installation), Jenkins engineers can be of valuable assistance.

Send the coupon today for the new folder describing the complete line of Jenkins Stainless Steel Valves. It includes specifications and helpful data on selection.

Jenkins Bros., 100 Park Ave., New York 17, Bridgeport, Conn.; Atlanta; Boston; Philadelphia; Chicago; San Francisco. Jenkins Bros., Ltd., Montreal.

Sold through leading Industrial Distributors

JENKINS BROS.
100 Park Ave., New York 17, N. Y.
Please send Stainless Steel Valve Folder — Form 194.

NAME_____

COMPANY_____

ADDRESS_____

JENKINS
LOOK FOR THE DIAMOND MARK
VALVES
SINCE 1864
TRADE JENKINS MARK

EXTRACTIVE CHEMISTRY COMPOSES

a Symphony of Flavor

ROYAL SOLUBLE SEASONINGS

At last! . . . the potency, purity and uniformity of spice flavors are no longer subject to the discordant whims of nature. Griffith's newly developed extraction process* removes "false" flavor elements . . . recaptures vital flavor undertones . . . and sets a new high standard of symphonic flavor quality in ROYAL SOLUBLE SEASONINGS.

Never have you or your customers tasted such *true* spice flavors—*never*, if you've used soluble spice made from ordinary **"complete"** extractions! PEPPEROYAL or your special blend of ROYAL SOLUBLE SEASONINGS will give your products an exceptional flavor appeal that will sell and resell more new customers, because Griffith's revolutionary process* of extraction assures uniform *true* flavor, year in year out.

A trial will be a revelation. Write today.

*Patents Applied for

The

GRIFFITH

LABORATORIES, Inc.

In Canada—The Griffith Laboratories, Ltd.

CHICAGO 9, 1415 W. 37th St. • NEWARK 5, 37 Empire St. • LOS ANGELES 58, 4900 Gifford Ave. • TORONTO 2, 115 George St.

The Word is

con-tin'u-ous

"...without cessation or interruption"...Webster's Dictionary

The Method is

DE LAVAL CENTRIFUGALS

continuous

—for the separation of two liquids

—for the clarification of one or two liquids

—for the separation of two liquids plus the continuous removal of solids from one or both

All De Laval machines have one basic advantage in common —they all speed up processing operations by making them continuous. By making most effective use of centrifugal force to separate or clarify liquids, these machines eliminate costly delays that gravity or inefficient filtration methods require. De Laval centrifugals do in a few seconds work that otherwise would take minutes or even hours.

De Laval has available so many different types and sizes of machines that there is always **one** that meets your particular needs best. Ask a De Laval engineer to call.

THE DE LAVAL SEPARATOR COMPANY
165 Broadway, New York 6 427 Randolph St., Chicago 6
DE LAVAL PACIFIC CO., 61 Beale St., San Francisco 5
THE DE LAVAL COMPANY, Limited, Peterborough, Ont.

Why De Laval?

De Laval has over 70 years experience in solving problems of separation and clarification. Your problem may be quite similar to one that has already been solved by De Laval centrifugals. It will pay you to ask.

IT'S *De Laval* **CENTRIFUGALS**

for Speeding Production by
CONTINUOUS
Separation and Clarification

Serving Industry... which Serves Mankind

PROFIT POSSIBILITIES FOR FOOD INDUSTRY

Monsanto Flavor and Aroma Chemicals are one group among more than 400 Monsanto Chemicals and Plastics, of which more than two score directly serve the Food Industry. If you would like information on how these products can help you improve your products, cut costs or increase sales, mail the coupon or contact the nearest Monsanto Sales Office.

PRODUCTS OF HIGH PURITY

Monsanto Flavor and Aroma Chemicals are uniformly high in quality and they have purity that is obtainable only in synthetics. Such uniform purity is your assurance of identical flavors and aromas every time you employ these chemicals. Monsanto Flavor and Aroma Chemicals have full strength and have the ability to "stay" through processes which require extremes of heat or cold. Such "staying power" gives your products inviting aromas and appealing flavors to create *first* sales and bring *repeat* purchases. Specify Monsanto Flavor and Aroma Chemicals.

ETHAVAN (Monsanto's ethyl vanillin), used in both cones and ice cream, has the "staying power" even through heat of baking . . . through alternate heat and cold of ice cream making. Ethavan is used wherever delightful vanilla-like flavor and aroma are desired. Ethavan is economical because it has approximately three times the flavoring strength of vanillin. Monsanto also produces vanillin.

COUMARIN and VANILLIN

have broad roles in serving the food industry. They are used to mask undesirable tastes and odors in paper, which are often picked up by such products as candy and cookies. And, of course, they give food products superior flavor. Coumarin, which has been made by Monsanto since 1915, is one of the purest chemicals known. It is used alone or to "fixative" other flavor and aroma chemicals, such as Ethavan and vanillin.

METHYL SALICYLATE,

U. S. P., Monsanto's synthetic oil of wintergreen, is chemically identical with the natural product but methyl salicylate has higher purity and greater uniformity.

SACCHARIN fills all the requirements of a perfect sweetener. It is approximately 375 times as sweet as sugar . . . is easy to use . . . is economical. Monsanto was the first American company to produce saccharin.

FREE PAMPHLETS on Monsanto Flavor and Aroma Chemicals give you a great deal of technical information and many suggestions on the use of flavors and aromas. Indicate the literature you want, and mail the coupon today. MONSANTO CHEMICAL COMPANY, Organic Chemicals Division, 1737-G South Second Street, St. Louis 4, Missouri.

Ethavan: Reg. U. S. Pat. Off.

DISTRICT SALES OFFICES: Birmingham, Boston, Charlotte, Chicago, Cincinnati, Cleveland, Detroit, Houston, Los Angeles, New York, Philadelphia, Portland, Ore., San Francisco, Seattle. In Canada, Monsanto (Canada) Ltd., Montreal.

MONSANTO
CHEMICALS — PLASTICS

MONSANTO CHEMICAL COMPANY
Organic Chemicals Division
1737-G South Second Street, St. Louis 4, Missouri

Please send literature as indicated. . . . . Booklet, "Something About The Senses." . . . . Leaflet, "Coumarin." . . . . Leaflet, "Ethavan." . . . . Leaflet, "Methyl Salicylate." . . . . . Leaflet, "Saccharin." . . . . . Leaflet, "Vanillin."

Name ..... *Title* .....

Company .....

Street .....

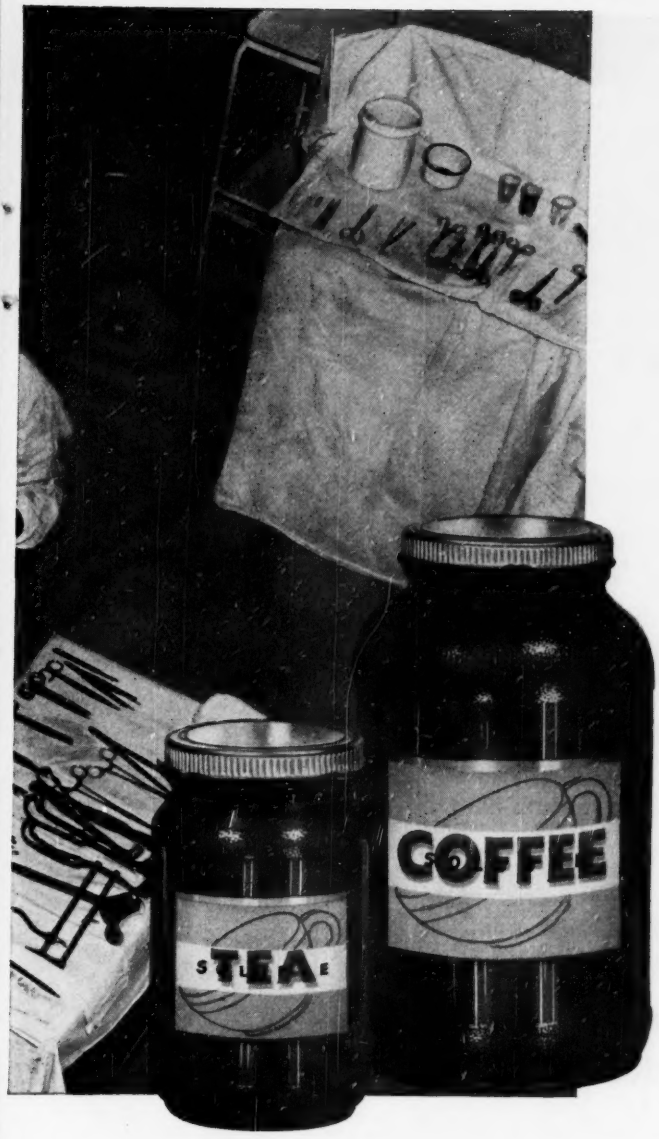
City ..... *Zone* ..... *State* .....

SERVING INDUSTRY . . . WHICH SERVES MANKIND

When you want the BEST go to the BEST

And for Packaging it's GLASS

The transparent glass package displays your products with all their colorful eye and appetite appeal. High in chemical durability, it does not change their taste or aroma, will not rust, corrode or leak. Easy to open, easy to use, easy to reseal to protect unused portions, it makes the most convenient package. It lends itself to individuality in size and shape, hence is adaptable to any product. Preferred by consumers because it is sanitary and convenient . . . by retailers because of its sales and merchandising advantages. Select your source of supply for glass packages as carefully as you would a surgeon, attorney or other specialist.
Anchor Hocking Glass Corporation, Lancaster, Ohio.



Anchorglass*

SOLUBLE COFFEE AND TEA JARS

Pack your soluble coffee and soluble tea products in strong, durable *Anchorglass* Jars. They are designed especially for ease of handling, easy access to contents, efficient product protection, economy and display in packaging and merchandising your products. *Anchorglass* Containers are the result of carefully selected and controlled raw materials, consistency in manufacture, uniform distribution of glass, accurate annealing, quality control through laboratory tests and regular inspections. They are uniform in height, diameter and finish. But whether you pack soluble coffee, tea or other food products, there are *Anchorglass* Containers in styles, capacities and colors that will meet your requirements.

ANCHOR

AMERSEAL* CAPS

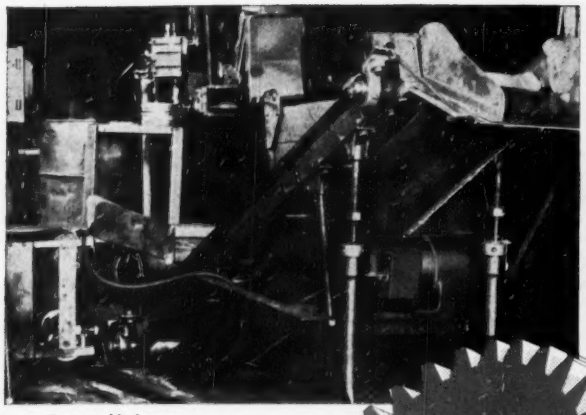
Seal frequently used food products with easy off-and-on *Anchor* Amerseal Caps. A quarter-turn, a simple twist of the wrist and the Amerseal is off. A quarter-turn and it seals again—an ideal closure for soluble coffee, tea and many other products that are opened many times before they are all consumed. *Anchor* Amerseal Caps are adaptable for use with all products requiring a dependable airtight seal and not affected by bacterial decomposition. They are available in 18 sizes from 20 to 120 mm. Let us tell you more about the advantages and economies of *Anchorglass* Containers and *Anchor* Amerseal Caps.

*Trade-Mark

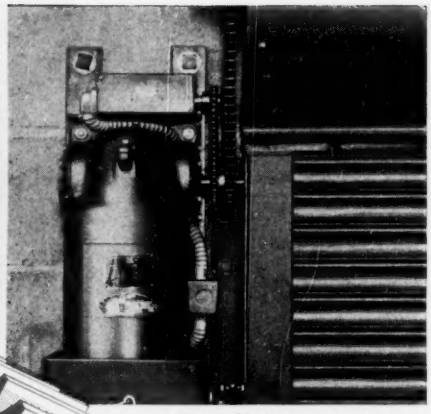
For the BEST in Glass Packaging *it's*

ANCHOR HOCKING

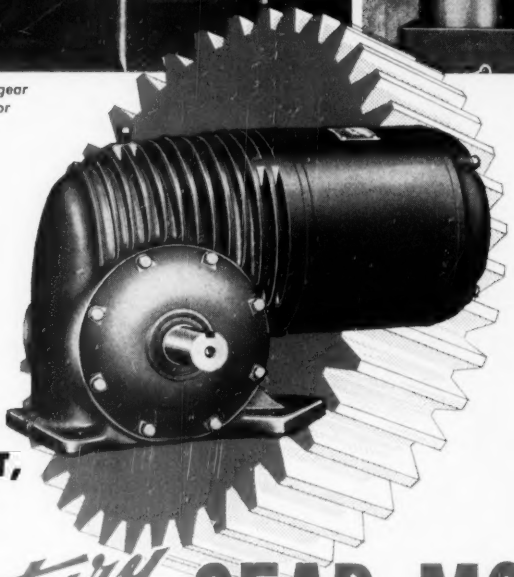
"THE MOST FAMOUS NAME IN GLASS!"



Century ¼ horsepower gear motor driving a conveyor



Century ½ horsepower gear motor operating a door opener



Specify COMPACT, RUGGED

Century GEAR MOTORS

for Your High Torque Slow Speed Requirements

Century's line of gear motors has gained an enviable reputation, created by their successful performance on thousands of industrial machines. They are built to supply the right power at the right speed.

Century Gear Motors are engineered to maintain the high torque slow speed shaft in rigid alignment. The gear housing and mounting feet are cast in one piece to provide extra strength and rigidity. In addition, the slow speed shaft is located near the base for greater strength and rigidity.

The motor is equipped with ball bearings and the shaft with tapered roller bearing.

Century Gear Motors are available in sizes from ⅛ to 1½ horsepower — single phase, polyphase and direct current.

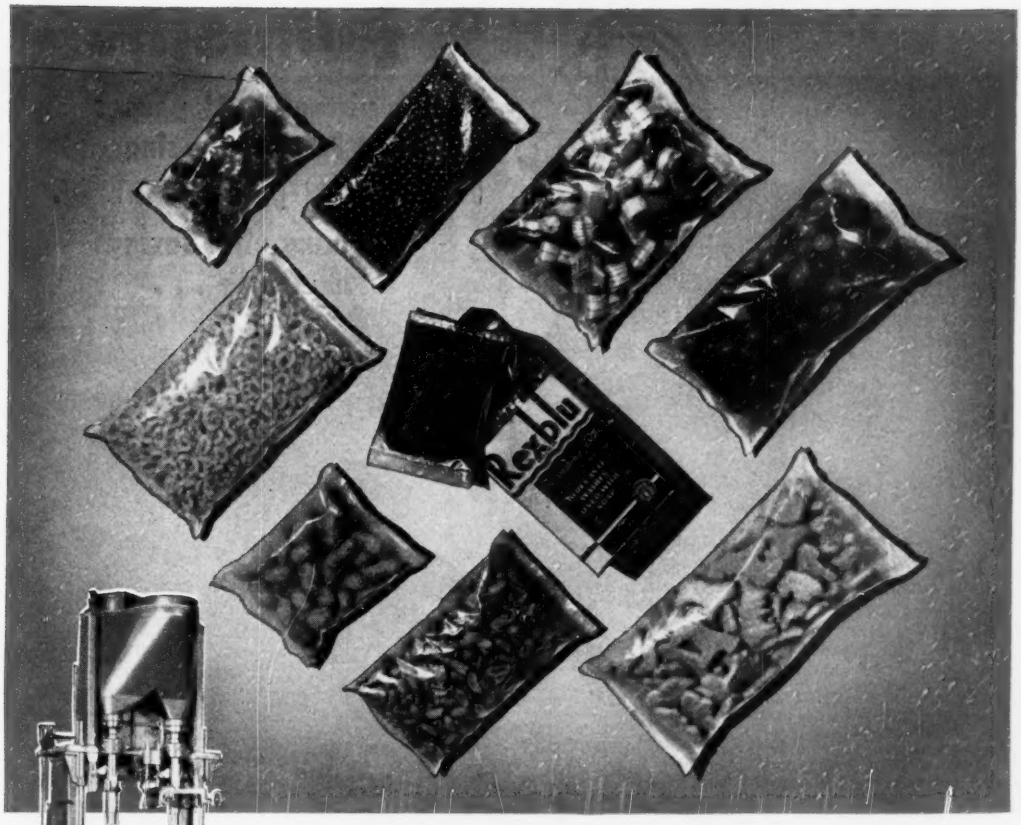
Specify Century Gear Motors for all your slow speed power requirements.

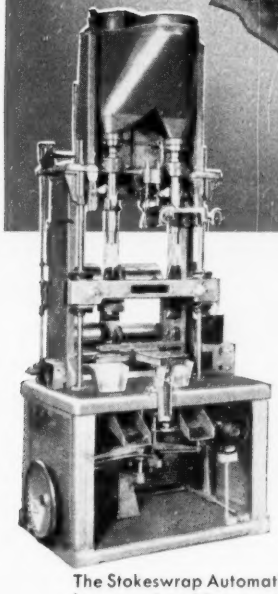
CENTURY ELECTRIC COMPANY

1806 Pine St., St. Louis 3, Missouri

Offices and Stock Points in Principal Cities

CE-664





POLYETHYLENE PACKAGES ON STOKESWRAP PACKAGING MACHINES

Some of the products particularly suited for packaging in Polyethylene film are the following:

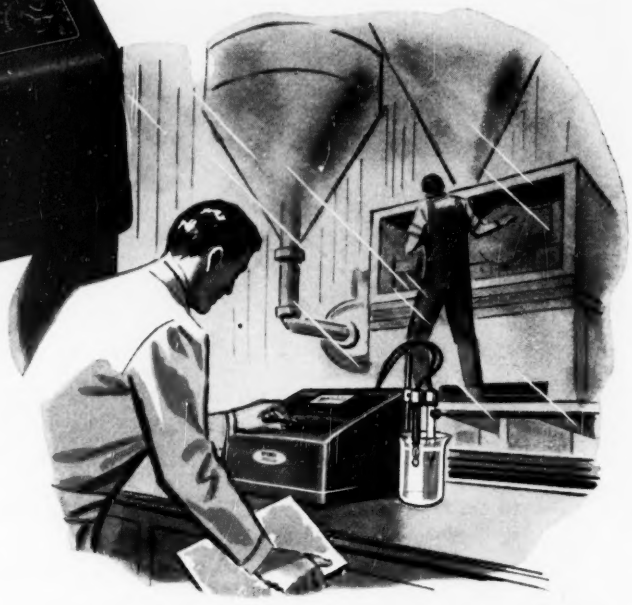
Soap powders
Bleach and chemical powders
Liquids
Syrups
Creams and pastes
Small metal parts
Air rifle shot
Ball bearings and hardware
Marbles
Frozen foods
Nuts and hard candies
Dehydrated products
Hygroscopic products
Powdered milk products

The Stokeswrap Automatic Packaging Machine has been produced for a number of years for handling various heat sealing films, such as Cellophane, Pliofilm, heat sealing foil, heat sealing papers, etc., and the new machines are now equipped to handle Polyethylene film, either printed or unprinted. Use of Polyethylene films give a stronger package, allowing heavier weights of products to be handled and also giving added protection for many products which heretofore could not be packaged in flexible packages.

Exclusive West Coast Distributor:
Anderson-Barngrover Division of FMC
San Jose 5, California

STOKES & SMITH Co
PACKAGING MACHINERY **PAPER BOX MACHINERY**
Subsidiary of Food Machinery and Chemical Corporation
4911 Summerdale Ave., Philadelphia 24, U. S. A.

In virtually ALL phases of Food Processing BECKMAN pH CONTROL is making vital savings like these . . .



THE BECKMAN MODEL H-2 pH METER is one of a complete range of Beckman pH Meters available for every type of application*. The H-2 is particularly recommended for applications where high accuracy and simple operation—combined with the convenience and low cost of 115-v. AC operation—are desired.

It provides instant and direct pH readings, and a simple, built-in dial permits quick, convenient temperature compensation over the entire range of 0° to 100°C (32° to 212° F.). High reading accuracy is assured by wide-spread dual range scale that reads from 0 to 8 pH or from 6 to 14 pH at the turn of a switch. Same switch also provides instant millivolt readings from 0 to ±800 mv and from ±600 to ±1400 mv for titrations and oxidation-reduction measurements.

Built-in electrode support and compact case design save valuable space and permit easy portability to various plant locations.

Particularly important is the wide range of factory-sealed, maintenance-free Beckman Glass Electrodes available for use with this instrument . . . electrodes that are virtually unbreakable . . . that cover extreme temperature ranges from below freezing to above boiling . . . that have an unprecedented pH range with negligible errors . . . that are abrasion-resistant and chemically durable to a degree never before thought possible in glass electrodes.

*In addition to the H-2 Meter, other Beckman pH equipment includes completely automatic pH indication and control instruments for large-scale process applications . . . battery-operated models for complete portability in plant and field use . . . and a laboratory type instrument that features maximum versatility and accuracy for research and laboratory applications

Throughout the food industry—in baking, canning, sugar refining, brewing, milk processing and a wide range of other operations—cost-conscious operators are making important savings by Beckman-controlling the pH of their processes. Some of the many benefits resulting from Beckman pH Control include:

- **. . . better quality, greater uniformity, fewer rejects in the baking of crackers, bread and other bakery products.**
- **. . . improved fermentation control in brewing, wine making and distilling processes.**
- **. . . better quality and flavor in a wide range of dairy processing and cheese making operations.**
- **. . . more accurate control of flavor and quality, better jel consistency, in jam and jelly making.**
- **. . . improved sterilization, flavor and quality in various canning and preserving operations.**
- ***. . . and valuable savings in time and processing costs in many other food processing operations.***

If you have not yet investigated the savings Beckman pH Control can make in your particular food processing operations it will pay you to discover what others—possibly your own competitors—are doing to cut costs, improve quality and enhance flavor and marketability with the aid of Beckman pH Instruments.

The Beckman Model H-2 pH Meter illustrated above is ideal for most food processing plants because of its high accuracy, its inexpensive AC operation and its simple direct-reading convenience. Let our trained engineers show you how this instrument can quickly pay for itself and produce year-round savings in your operations. For further details see your nearby authorized Beckman dealer—or write direct. **Beckman Instruments, National Technical Laboratories, South Pasadena 18, Calif.**

BECKMAN INSTRUMENTS
control modern industries

Beckman Instruments: pH Meters and Electrodes — Spectrophotometers — Radioactivity Meters — Special Instruments

Something to sing about!

Archer

SALAD AND COOKING OILS

For clarity of color, blandness, purity and uniformity . . . food men everywhere are singing the praises of Archer Soybean Salad and Cooking Oils.

There's a big technical story behind ARCHER "S", our salad oil, and ARCHER "C", our cooking oil. Both are refined and deodorized by continuous process at our splendid new Decatur plant. And as the largest processor of oilseeds, ADM brings to the food industries a wealth of laboratory research and experience in refining.

You'll want to know more about ARCHER "S" and ARCHER "C". And the easiest way to find out is to mail the coupon at the right for samples. *Be sure to mail it today.*

Made at Decatur, Illinois by

ARCHER • DANIELS • MIDLAND CO.

HOME OFFICE MINNEAPOLIS, MINNESOTA

ARCHER "S" and ARCHER "C"
America's finest edible soybean oils!

ARCHER • DANIELS • MIDLAND CO.
600 Roanoke Building • Minneapolis, Minnesota

● Please send sample of ☐ Archer "S" Soybean Salad Oil ☐ Archer "C" Soybean Cooking Oil

*Name*_____

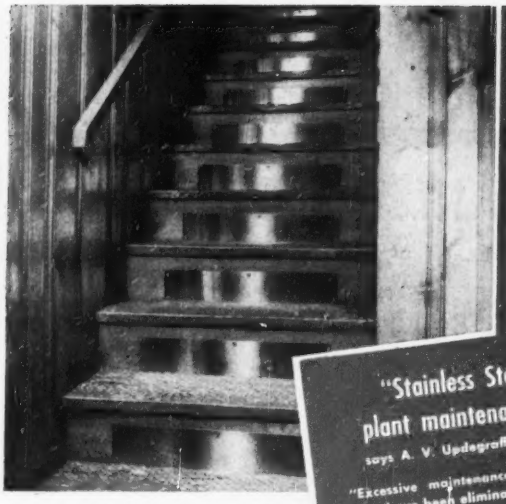
*Company*_____

*Address*_____

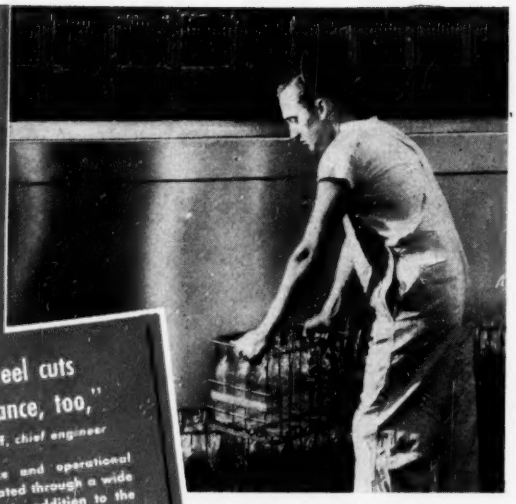
*City*_____ *Zone*___ *State*_____

Not just in processing equipment

Old Meadow Creamery reduces costs



Stainless Steel kick-plates on these risers modernize this stairway while reducing maintenance almost to zero.



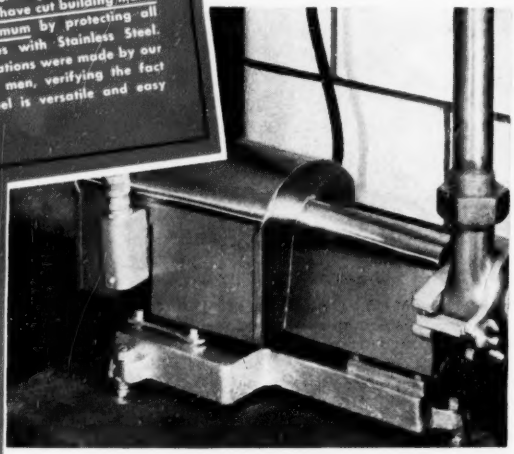
U·S·S 18-8 Stainless Steel sheets make an easily-maintained, 53-inch wall in the bottle washing room.

"Stainless Steel cuts plant maintenance, too,"

says A. V. Updegraff, chief engineer

"Excessive maintenance and operational costs have been eliminated through a wide use of Stainless Steel. In addition to the usual applications in such equipment as pasteurizers, holding tanks, weigh tanks, homogenizers, cottage cheese vats, refrigerating units, piping, bottle washers, cappers and fillers, we have cut building maintenance to a minimum by protecting all vulnerable surfaces with Stainless Steel. Most of the installations were made by our own maintenance men, verifying the fact that Stainless Steel is versatile and easy to fabricate."

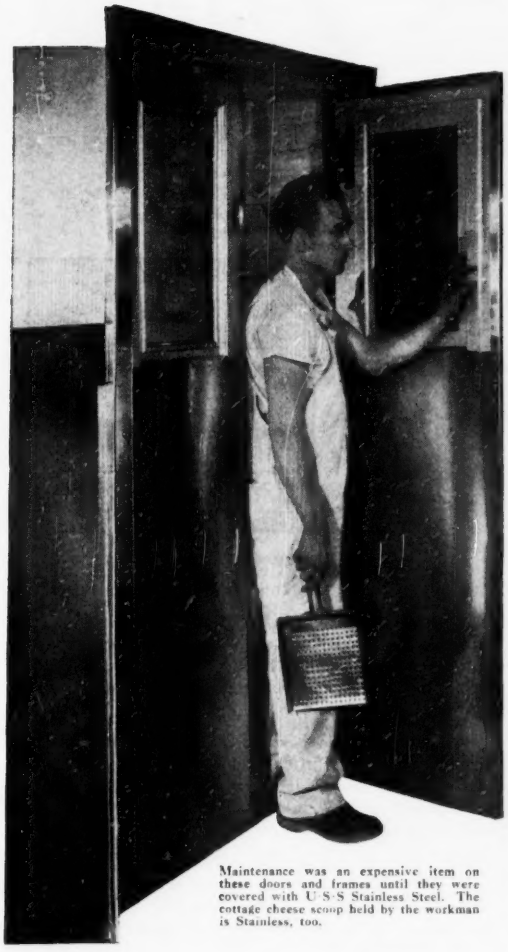
Sink and splash shield in this hand bottle-washing unit are fabricated from U·S·S Stainless Steel.



Stainless Steel shield protects this transfer pump motor against moisture and adds greatly to machinery life.

but everywhere in the plant

...with U·S·S Stainless Steel



Maintenance was an expensive item on these doors and frames until they were covered with U·S·S Stainless Steel. The cottage cheese scoop held by the workman is Stainless, too.

Most dairies are well aware of the outstanding sanitary qualities of Stainless Steel milk processing equipment, and they've made it standard practice to use Stainless for everything that touches the product. But The Old Meadow Creamery Company, Cleveland, Ohio, has taken even greater advantage of Stainless Steel's benefits —they're using it *everywhere* in the plant.

In the bottle-washing room, constant steam and water from machinery, frequent rinsing of walls and floor, and damage from milk crates made it almost impossible to maintain a painted wall. A 53-inch facing of U·S·S Stainless Steel sheets on all four walls solved the problem.

Doors, too — constantly wet from frequent washings — receive hard usage from being rammed by dollys loaded with cases. To eliminate painting and other repair and replacement costs, doors and frames were surfaced with U·S·S 18-8 Stainless Steel sheets. Instead of replacement every four or five years, the doors are now ready for many years of trouble-free service.

Because of the frequent wetting from necessary flushing, pump motors lasted only nine to twelve months. Stainless Steel shields were designed for the motors. Motors protected by Stainless Steel have now given more than two years' service and are still going strong.

These and many other applications of U·S·S Stainless Steel at the Old Meadow plant demonstrate that there's almost no limit to the many ways you can use Stainless to reduce maintenance costs in a modern dairy. Its exceptional corrosion resistance, its ease of cleaning and maintenance, its strength and durability, its lasting good looks make U·S·S Stainless Steel the ideal material *throughout* the plant.

It will pay you to use U·S·S Stainless Steel, as Old Meadow Creamery did. This perfected, service-tested material is available in a wide variety of forms, grades and finishes. With U·S·S Stainless you can count on the finest performance.

AMERICAN STEEL & WIRE COMPANY, CLEVELAND · CARNEGIE-ILLINOIS STEEL CORPORATION, PITTSBURGH
COLUMBIA STEEL COMPANY, SAN FRANCISCO · NATIONAL TUBE COMPANY, PITTSBURGH · TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM
UNITED STATES STEEL SUPPLY COMPANY, WAREHOUSE DISTRIBUTORS, COAST-TO-COAST · UNITED STATES STEEL EXPORT COMPANY, NEW YORK

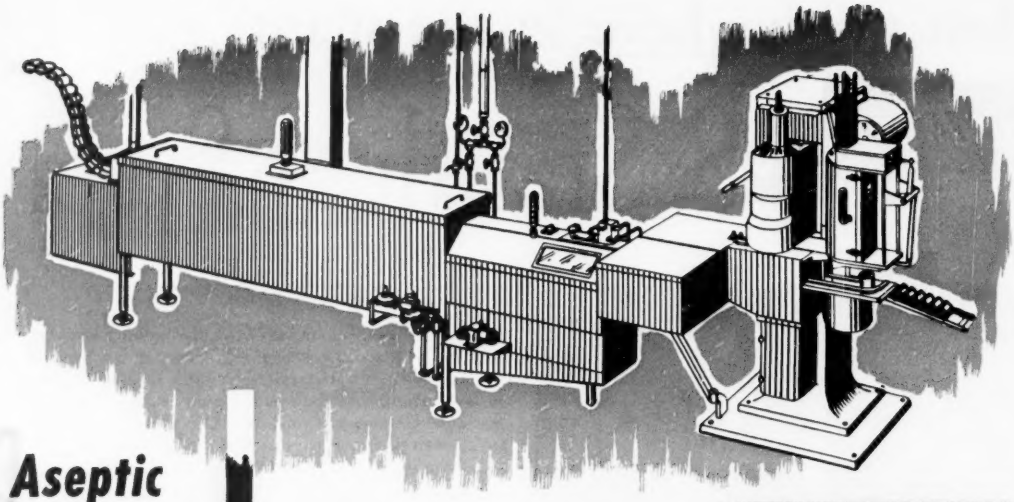
USS

U·S·S STAINLESS STEEL

SHEETS · STRIP · PLATES · BARS · BILLETS · PIPE · TUBES · WIRE · SPECIAL SECTIONS

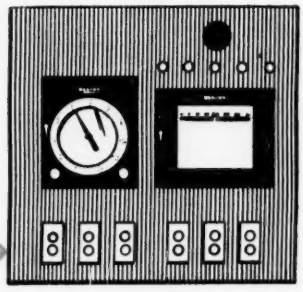
D-1307

UNITED STATES STEEL



Aseptic Canning Is Big News!

NEW PROCESS IS GUARDED BY BROWN TRIPLE-SAFE CONTROL SYSTEM



THE trend from "batch" to "continuous flow" takes one more big step forward!

Shown above is equipment designed for the Martin Aseptic Canning Process . . . a unique, time-saving *continuous* flow operation in which sterile conditions preclude all chance of contamination. To avoid localized overheating, fluid food is cooked as a thin film *before* canning . . . and then packed into sterile cans. Flavor, vitamin content, color and texture are preserved intact.

For this sensational process Honeywell Engineers devised a triple-safe control system: (1) controlling and recording instruments to maintain desired temperatures; (2) non-indicating controllers to operate signal lights, sound alarms or shut down the process when temperatures vary beyond preset limits; and (3) a multi-point *ElectroniK* Recorder to group many temperature statistics on a single chart for ready reference.

Only *creative instrumentation* makes such an advance possible. It is the key to superior quality, undreamed of a decade ago, at lower unit cost . . . and, of course, acts as a powerful stimulus to sales. Call in your local Honeywell Engineer for a discussion of such function-fitted *control for your processes* . . . he is as near as your phone!

MINNEAPOLIS-HONEYWELL REGULATOR CO., *Industrial Division*, 4502 Wayne Ave., Philadelphia 44, Pa. Offices in more than 80 principal cities of the United States, Canada and throughout the world.

FOR THE FOOD INDUSTRY

MINNEAPOLIS **Honeywell**

BROWN INSTRUMENTS

for added richness in your food flavors:

CORPS PRALINE

Exceptional results have been achieved in mixtures of fruit and food flavors through the addition of CORPS PRALINE. It is a synthetic aromatic of ketonic nature, whose presence in minute quantities produces unusual, enriched flavor effects.

CORPS PRALINE is a crystalline substance of highest purity, remarkably stable under cooking and baking temperatures. It has a natural-type, fruity aroma when used in fruit flavors; in higher concentrations in mixtures or when used directly in food products, it tastes somewhat like caramel.

Samples and technical information on solubility and methods of application are available.

FIRMENICH & CO.
250 WEST 18th STREET, NEW YORK 11, N. Y.

CHICAGO OFFICE: 612 NORTH MICHIGAN AVENUE
IN CANADA: CARAMEED, LTD., 350 WALLACE AVENUE, TORONTO
GENEVA, SWITZERLAND . . . PARIS, FRANCE

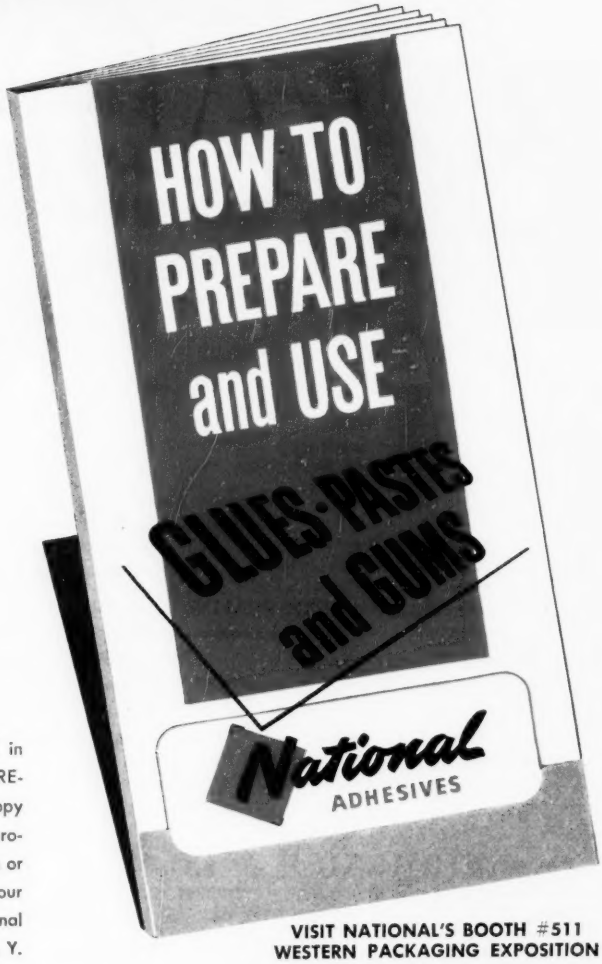
FIRMENICH & CIE.
SUCCESSEURS DE
CHUIT NAEF & CIE.
GENEVE SUISSE

FREE
Having Glue Trouble?
BOOKLET

How are you handling:

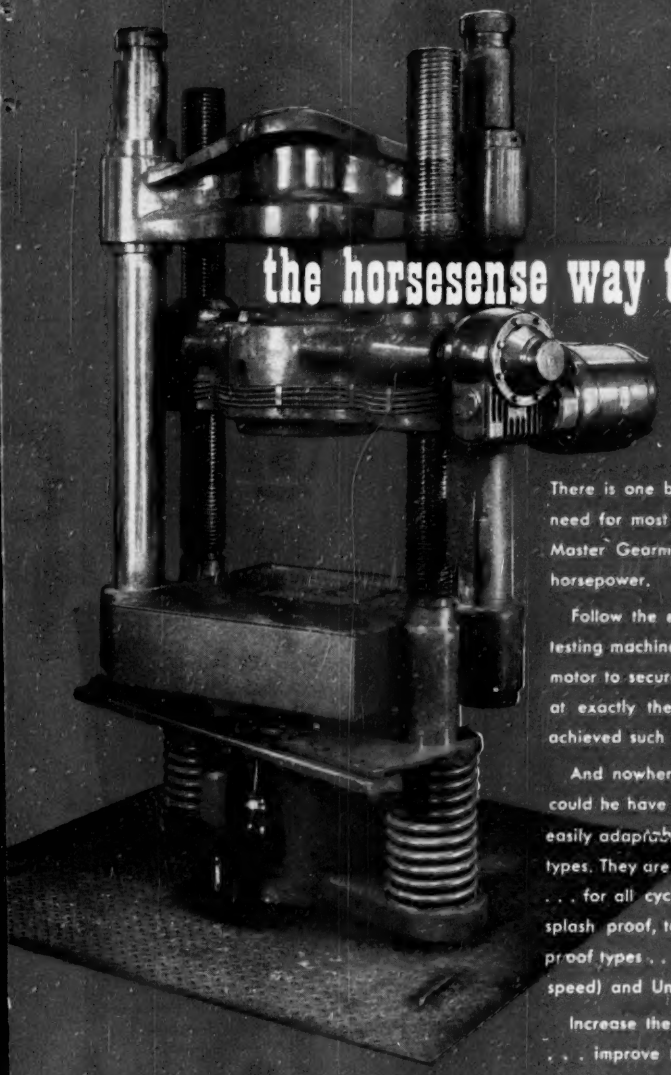
- ☐ Storage
- ☐ Opened Containers
- ☐ Equipment Cleanliness
- ☐ Thinning
- ☐ Cold Water Soluble Dry Adhesives
- ☐ Prevention of Crusting
- ☐ Hot Melt Adhesives
- ☐ Flexible Glues
- ☐ Replacement of Solvents
- ☐ Resyn® Adhesives

You'll find the proper methods clearly outlined in National's indispensable booklet: HOW TO PREPARE AND USE GLUES, PASTES AND GUMS. A copy should be in the hands of every one of your key production men . . . and every employee that handles or uses glues, pastes, gums. Jot down their names on your letterhead. We'll do the rest—free of charge! National Adhesives, 270 Madison Avenue, New York 16, N. Y.



VISIT NATIONAL'S BOOTH #511
WESTERN PACKAGING EXPOSITION

EVERY TYPE OF ADHESIVE FOR EVERY INDUSTRIAL USE



the horsesense way to use horsepower

There is one best way to secure the slower speeds you need for most of your motor driven machinery . . . use Master Gearmotors . . . the horsesense way to apply horsepower.

Follow the example of the designer of this materials testing machine. See how he has used this Master Gearmotor to secure power right where he needs it . . . and at exactly the right speed. How else could he have achieved such a compact, clean-cut, economical design.

And nowhere, but in the Master line of Gearmotors, could he have found power units that are so flexible, so easily adaptable and in such a wide range of sizes and types. They are available in any size, 125 HP and smaller . . . for all cycles, phases and frequencies . . . in open, splash proof, totally enclosed, fan cooled and explosion proof types . . . with Speedrangers (mechanical variable speed) and Unibrakes . . . for every type mounting.

Increase the salability of your motor driven products . . . improve the economy, safety and productivity of your plant equipment, with Master Gearmotors . . . the horsesense way to use horsepower.

THE MASTER ELECTRIC COMPANY
DAYTON 1, OHIO

DID PNEUMATIC HAVE A HAND IN YOUR DESSERT LAST NIGHT?

KRE-MEL, TUMBO, CLINTON, AMAZO, KROGER, DAINTY JELL, MY-T-FINE, MINUTE TAPIOCA

Installation of Pneumatic's Double Package Maker equipment in production of KRE-MEL Dessert at plant of Corn Products Refining Company, Argo, Ill.

PROBABLY YES—

because America's leading makers of packaged desserts use Pneumatic Packaging Machines!

And there's good reason why so many famous manufacturers rely on Pneumatic Packaging Machines. They've found that the sturdier construction, the precision engineering of Pneumatic Machines assure them of speedier, lower-cost package output!

Pneumatic's Double Package Maker, for instance, forms a protective lining and then shapes a carton around it. The snug-fitting inner bag allows maximum fill, offers far greater product protection.

That's just one example of Pneumatic's packaging efficiency and convenience. In a half-century of highly specialized operations, Pneumatic research has developed more than ninety different machines to handle your packaging and bottling needs, speedily, competently . . . to give you Pneumatic's famous "lower cost per container" performance!

★ ★ ★

PNEUMATIC SCALE CORPORATION, LTD., 91 Newport Ave., Quincy 71, Mass. Branch Offices in New York, New York; Chicago, Illinois; San Francisco and Los Angeles, California; Seattle, Washington.

PNEUMATIC

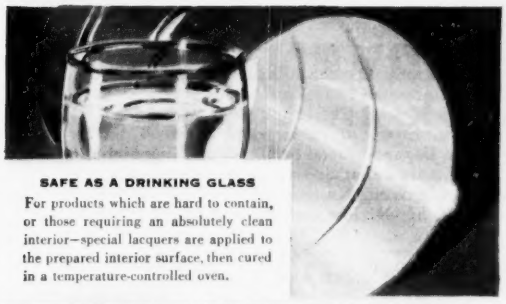
PACKAGING AND BOTTLING MACHINERY

WORLD'S FIRST COMPLETELY LITHOGRAPHED AND INNER ROLLER-COATED 55-GALLON STEEL DRUM

Rheem R

BIG CONTAINERS NOW "TRAVELING BILLBOARDS"

Consider the merchandising opportunities this remarkable new package presents! The durable and lustrous finish of Rheemcote drums, lithographed with *your* distinctive colors, trademarks and designs, will billboard your product and name before the eyes of the world.

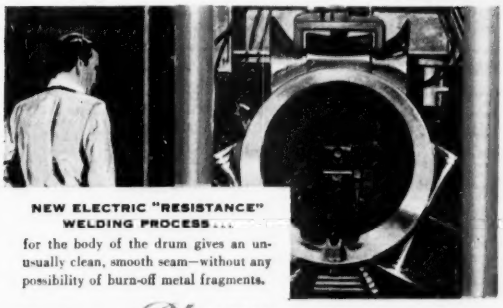


SAFE AS A DRINKING GLASS

For products which are hard to contain, or those requiring an absolutely clean interior—special lacquers are applied to the prepared interior surface, then cured in a temperature-controlled oven.

ROLLER-COATING OPERATION...

applies the base coat to the steel surface, assuring positive adhesion for utmost resistance against weather and handling.



NEW ELECTRIC "RESISTANCE" WELDING PROCESS...

for the body of the drum gives an unusually clean, smooth seam—without any possibility of burn-off metal fragments.

After many years of research, the Rheem Manufacturing Company, world's largest maker of steel shipping containers, is proud to have developed the Rheemcote Process in this, its 25th year of service to industry.

For a *free*, descriptive, beautifully illustrated brochure on this important contribution to marketing—write or wire Rheem today.

Rheem R

RHEEM MANUFACTURING COMPANY
570 Lexington Avenue, New York 22, N. Y.
Plants and Affiliates Throughout The World

Rely on Rheem to Deliver Your Goods..and Goodwill

©1950

...and thank PERVENAC* for that Quality Look in Labeling!

You're looking at a variety of products and surfaces which are now being labeled *better, faster, more neatly* with Pervenac. These labels won't drop off. They won't tear at the edges. They won't smear. They never need straightening. And no production time is lost for preparing glue pots or glue clean up. As for labeling speed . . . users report increases up to 400%!

Whether you package in wet or dry glass or curved or flat, in paper, metal or film — you'll get labeling performance that does your product justice with Pervenac. Write Nashua direct or have your printer contact his Nashua distributor listed below.

*Trade Mark
Manufactured under patent 2,462,029

NASHUA GUMMED AND COATED PAPER COMPANY
NASHUA, NEW HAMPSHIRE

NASHUA
MAKES PAPER MAKE MONEY FOR YOU

NASHUA HEAT SEAL PAPER DISTRIBUTORS

ALBANY, N. Y.
Hudson Valley Paper Company
ALBUQUERQUE, N. M.
Carpenter Paper Company
ATLANTA, GA.
Whitaker Paper Company
AUGUSTA, ME.
Carter, Rice & Company
AUSTIN, TEX.
Carpenter Paper Company
BALTIMORE, MD.
Whitaker Paper Company
BILLINGS, MONT.
Carpenter Paper Company
BOSTON, MASS.
Carter, Rice & Company
John Carter & Company, Inc.
BUFFALO, N. Y.
The Alling & Cory Company
BUTTE, MONT.
Carpenter Paper Company
CLEVELAND, OHIO
The Alling & Cory Company
CHICAGO, ILL.
Bradner Smith & Company
Dwight Brothers Paper Company
Carpenter Paper Company
CINCINNATI, OHIO
Whitaker Paper Company
COLUMBIA, S. C.
Epes Fitzgerald Paper Co., Inc.
DALLAS, TEX.
Carpenter Paper Company
DENVER, COLO.
Carpenter Paper Company
DES MOINES, IOWA
Carpenter Paper Company
DETROIT, MICH.
Whitaker Paper Company
EL PASO, TEX.
Carpenter Paper Company
FARGO, N. D.
The John Leslie Paper Company
FORT WORTH, TEX.
Carpenter Paper Company
GRAND ISLAND, NEB.
Carpenter Paper Company
GRAND RAPIDS, MICH.
Carpenter Paper Company
GREAT FALLS, MONT.
Carpenter Paper Company
The John Leslie Paper Company
HARLINGEN, TEX.
Carpenter Paper Company
HOUSTON, TEX.
Carpenter Paper Company
INDIANAPOLIS, IND.
Indiana Paper Company
KANSAS CITY, MO.
Carpenter Paper Company
LOS ANGELES, CALIF.
Carpenter Paper Company
LOUISVILLE, KY.
The Rowland Paper Company
LINCOLN, NEB.
Carpenter Paper Company
LUBBOCK, TEX.
Carpenter Paper Company
MILWAUKEE, WISC.
Bradner Smith & Company
Dwight Brothers Paper Company
MINNEAPOLIS, MINN.
Carpenter Paper Company
The John Leslie Paper Company
NEWARK, N. J.
Bulkley, Dunton & Company
NEW HAVEN, CONN.
Bulkley, Dunton & Company
NEW YORK CITY, N. Y.
Bulkley, Dunton & Company
Harry Elish Paper Company
George W. Millar & Company
Whitaker Paper Company
NORFOLK, VA.
Epes Fitzgerald Paper Co., Inc.
OGDEN, UTAH
Carpenter Paper Company
OKLAHOMA CITY, OKLA.
Carpenter Paper Company
OMAHA, NEBR.
Carpenter Paper Company
PHILADELPHIA, PA.
Rhodes Paper Company
D. L. Ward Company
PITTSBURGH, PA.
Whitaker Paper Company
PORTLAND, ORE.
West Coast Paper Company
PROVIDENCE, R. I.
Carter, Rice & Company
PUEBLO, COLO.
Carpenter Paper Company
RALEIGH, N. C.
Epes Fitzgerald Paper Co., Inc.
RICHMOND, VA.
Epes Fitzgerald Paper Co., Inc.
ROCHESTER, N. Y.
The Alling & Cory Company
ST. LOUIS, MO.
Acme Paper Company
ST. PAUL, MINN.
Carpenter Paper Company
The John Leslie Paper Company
SALT LAKE CITY, UTAH
Carpenter Paper Company
SAN ANTONIO, TEX.
Carpenter Paper Company
SAN FRANCISCO, CALIF.
Carpenter Paper Company
SEATTLE, WASH.
West Coast Paper Company
SIOUX CITY, IOWA
Carpenter Paper Company
SIOUX FALLS, S. D.
The John Leslie Paper Company
SPRINGFIELD, MASS.
Bulkley, Dunton & Company
SYRACUSE, N. Y.
The Alling & Cory Company
TOPEKA, KANSAS
Carpenter Paper Company
WASHINGTON, D.C.
Whitaker Paper Company
WORCESTER, MASS.
Charles A. Eaty Paper Company

EXPORT

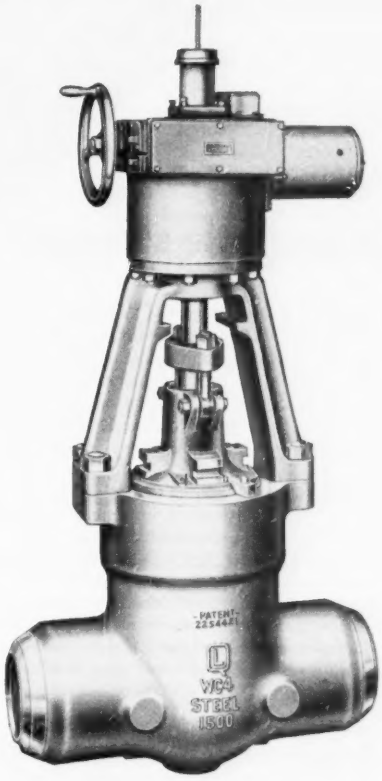
MEXICO, CENTRAL AMERICA, SO. AMERICA, SO. AFRICA, and the FAR EAST
American Paper Exports, Inc., New York City
UNITED KINGDOM, EUROPE, NO. AFRICA and the NEAR EAST
I. J. Sizer, 65 Ave. Niel, Paris

LUNKENHEIMER
. . . The Steel Valve With A Priceless Ingredient

Into every heat of Lunkenheimer molten steel goes one ingredient that no other valve foundry can duplicate. It's not measured in ounces or pounds — but in generations . . . of tradition. It is pride in the kind of workmanship that has made Lunkenheimer universally respected as the one *great* name in valves.

Engineers are accustomed to dealing in facts — not intangibles. But every realistic engineer knows that molten steel is tricky stuff to handle. It demands *more* from the workman than simple attention. Quality valves—safe valves—are not made by formula alone, but by care . . . interest . . . pride in an unbroken tradition of fine workmanship. At Lunkenheimer, that tradition goes back to 1862.

Lunkenheimer's priceless ingredient will always be intangible, but it can be expressed in terms of one interesting fact: *there is no instance on record where a Lunkenheimer steel valve has ruptured due to defective metal.* For more facts — and for information relating to your specific steel valve application — write immediately to The Lunkenheimer Co., P. O. Box No. 360Q, Annex Delivery Station, Cincinnati 14, Ohio.

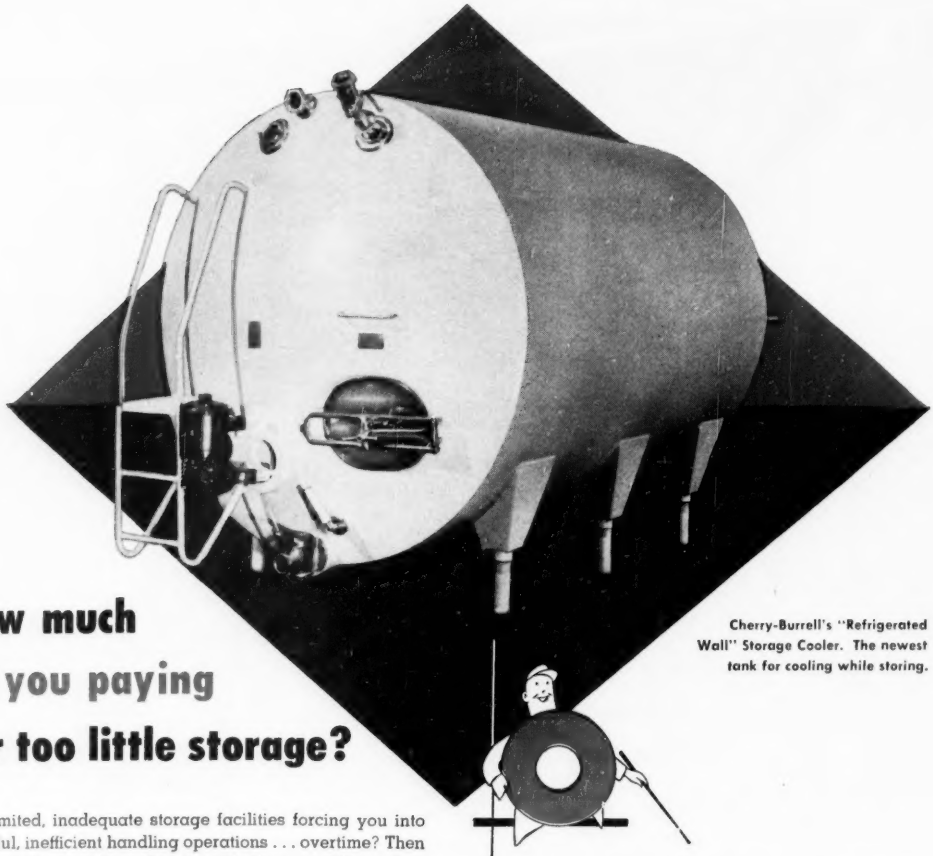


STEEL • IRON • BRONZE

LUNKENHEIMER

THE ONE *Great* NAME IN VALVES

L-750-13A



Cherry-Burrell's "Refrigerated Wall" Storage Cooler. The newest tank for cooling while storing.

how much are you paying for too little storage?

Are limited, inadequate storage facilities forcing you into wasteful, inefficient handling operations . . . overtime? Then you know how costly and intolerable they are. Now, when economical operation on an eight-hour-day basis is so important to your profit picture, the additional storage capacity of one or more Cherry-Burrell "Refrigerated Wall" coolers might well eliminate a serious production "bottleneck."

The Cherry-Burrell Storage Cooler can be used for additional cooling of milk, cream and other liquid foods and beverages, or when product must be held at low temperature for a long period. The stainless steel refrigerant passages are welded to the heavy gauge tank lining. Heavy materials, modern welding methods and expert craftsmanship assure a smoother inside tank lining. Many features for the operator's convenience include new ladder platform and deep dish heads with large knuckle radius for easy cleaning.

you'll find a full range of sizes

—1000 gallons and up—in the Cherry-Burrell line of Type DE "Refrigerated Wall" Storage Coolers. Also available is the Type D "Plain Insulated" Storage Tank with submerged coil, wrapped coil or spray-type cooling. Discuss your storage problems now with your Cherry-Burrell representative — and send the coupon today.

CHERRY-BURRELL CORPORATION

General Sales and Executive Office:
427 West Randolph Street, Chicago 6, Illinois
Milk and Food Plant Equipment and Supplies
FACTORIES, WAREHOUSES, BRANCHES, OFFICES OR DISTRIBUTORS AT YOUR SERVICE IN 56 CITIES

trendmaker in a great industry

Cherry-Burrell Corporation
Dept. 117, 427 West Randolph Street, Chicago 6, Ill.

Please send me complete details on the Cherry-Burrell Storage Cooler.

Name .....

Address .....

City..... Zone.... State.....

AUGUST, 1950

Food Industries

What Preparedness Program Means to Food Processors

There is little reason for food processors to be jittery over the present international situation. True, the preparedness program is having an economic impact. Shortages in some basic materials are coming. And military food requirements pose problems.

Because distributors were increasing their inventories, nonperishables were moving out of manufacturers' warehouses more rapidly in July. Consumers also were stockpiling. And the military was expected to build up its low supplies quickly. Such developments affect food movements and in some instances create artificial shortages.

But the effect is mostly temporary. Relative to many other industries, the food field will be pretty much on a business-as-usual basis. And the demand outlook is a healthy one.

The already booming economy will reach an ever higher level as the country gears to meet stepped-up defense requirements. And continued high consumer income, plus likely curtailment of consumer purchases of durables, should mean continued high-level civilian food consumption.

The increase in the armed forces will boost food demand a little. Not allowing for waste, the man in uniform perhaps will require 15 to 20 percent more than the average civilian. And there is, of course, a shift in types of food eaten. The soldier consumes less fluid milk, fruit and eggs. But he eats more cereal products, potatoes, butter, vegetables, meats, fats and coffee.

In July there were only 1.5 million in the armed forces, but the number was expected to increase a half million in a few months. Short of major war, however, the proportion of the population in the services will not be high enough to affect overall food demands greatly.

Another reason why the food processing business will be relatively normal is that the industry doesn't need to convert its plants in a preparedness program.

While there is no cause for undue concern, the defense program does point to some problems. One is a shortage of steel. With the steel industry already operating at capacity levels, the requirements of armament manufacturers call for allocation of steel. Tin and some chemicals also are expected to be tight. Cellophane already was short, with kraft board and corrugated boxes in fair supply, but rising in price.

Therefore it is common sense to replace equipment which is worn out, or to provide for needed new capacity. It likewise is a routine precaution to study substitute packaging materials, just in case. As in World War II, packaging problems may well be the food processor's greatest headache.

Another basic industrial requirement—labor—is just about as tight as steel, only 3.4 million being unemployed in June. With the stepped-up defense production, plus the military's manpower demands, many manufacturers likely will be hard put to find enough workers. It would be surprising if this doesn't boost wages, and prices, as will the inflationary trend.

Last, but not least, food processors owe it to themselves and to the country to study military food requirements. Many of these have been discussed in FI's current QM series of articles, one of which appears in this issue (page 46). Good food is quite as important as effective weapons.

No one knows what's ahead on the international scene, except that at best we face a substantial and protracted preparedness program of a semi-war nature.

But as of now the problems of food processors look quite simple compared to those of World War II days. There is plenty of food, we don't have to send Lend-Lease supplies all over the world, and imports of strategic materials have not been cut off.

So processors can approach potential problems with calm deliberation and at the same time do business as usual. They can even go ahead with their peacetime planning.

—F. K. LAWLER, *Editor*

A Decision by the "Chief Arbiter"—Mrs. John J. Housewife

IN HER OWN kitchen, housewife panel member tests the food, then jots her reactions on carefully worded questionnaire.

But What Do the *Consumers* Say?

One way to learn is to find a group that represents a true cross-section of your clientele. Here is why, how, and with what results Kroger did it

GEORGE GARNATZ
Director, Kroger Food Foundation, Cincinnati

To obtain consumer reactions to products in which we are interested, the Kroger Foundation set about forming a panel, which has been designated the Homemakers Reference Committee. This group embraces approximately 750 homemakers who have been carefully selected in line with these three requirements:

1. Representative geographical distribution throughout the territory served by our company. Each county thus has its quota of the membership in proportion to the number of retail outlets operated in that area.

2. High, medium and low income brackets represented in the proportions indicated by the latest available statistics.

3. Distribution of ages within the group corresponding to the latest census figures. The move to achieve this age distribution was initiated in 1946. As it worked out, the panel is a little older on the average than is indicated by the census. This, however, was considered satisfactory since, in its general direction at least, it anticipates the greater median age that the 1950 census will probably reflect.

The committee has been in existence since 1933, except for the war period. And over the years it has been consulted on a wide variety of products and subjects in the course of carrying out more than 110 tests. We find women quite ready to serve on the committee. They cooperate so wholeheartedly that in any given test a response of 80 percent or greater is the rule rather than the exception.

No difficulty is encountered in keeping the committee up to full strength, for there is always a large waiting list from which to recruit replacements caused by death, loss of address due to moving, resignation, or failure to participate in two consecutive tests. A high degree of *esprit de corps* exists within the committee. The members consider themselves an integral part of our organization.

Inner Group

Early in our experience, we consulted with the committee on canned beans with pork. It was indicated that our product was not in step with the competitive product enjoying the greatest acceptance among three brands submitted. Later, our product was developed to the point where the committee approved it by a 77 to 23 percent vote.

One of our branches was skeptical over the results, maintaining that the area it served possessed a local preference that would not be met by the new pack This provided us with an

opportunity to compare the committee with a more localized group. We therefore requested from the branch a list of 100 names and addresses it had compiled. To this group was submitted the new pack in comparison with the old. And our reliance in the guidance supplied by the results from the Homemakers Reference Committee was strengthened when the local group returned a perference for the new pack over the old in the proportion of 58 to 42 percent.

From this we developed the idea of forming a group known as the Inner Circle, consisting of 125 members within a short radius of Cincinnati to be used in preliminary testing and as a means of holding down the costs of such tests. We have found this group most helpful in supplying leads to be followed in our development work and in the "tuning-up" process.

As our work with the committee progressed, we wanted to know to what degree this group could return consistent results. On occasion, we have submitted identical tests, exercising the precaution to submit other tests between them so that the second identical test would be assumed to be a further stage of development of the product involved. The general results have indicated that the committee is reliable.

In the main, a test involves submission of two samples of the commodity under study. One sample is a product of known acceptance based on merchandising experience. The other is the test sample. Every effort is made to exclude possible recognition of the samples by removing all labels and any other tell-tale evidence and by, as nearly as possible, packing the test sample in a container identical to that holding the reference sample.

These samples are carefully coded in a way to avoid prejudicing the tester one way or the other. For example when numbers were employed, the use of something like "1" and "10" was avoided lest "1" should connote superiority. And with letters, the use of "A" and "Z" as codes was not followed for the same reason.

For sometime, practice in coding involved combinations like 7N and 8M with the intent of neutralizing any inclination to pick one product over the other because of any psychological influence of the codes. More recently, we have resorted to color codes and feel they combine the advantages of being non-committal and easy to apply rapidly.

Along with the test questionnaire mailed to each member there is a special letter. This is written in a vein of informality and aims (1) to encourage participation in the test, (2) to give the member some idea of what the test is all about, so that she may cooperate intelligently, and (3) to provide instructions or precautions to constantly remind the tester to maintain comparable conditions.

In drawing up the questionnaire itself, our prime purpose has always been to elicit reactions on pertinent points, avoiding the use of leading questions. In order to overcome the tenden y to express a preference where no appreciable difference exists, an opportunity is always given the taster to record "no choice." The questionnaire usually starts out with directions for conducting the test, including, when necessary, a suggestion for preparing the samples to be tested. And then the first question is, generally, designed to gage the tester's reaction to the samples without the benefit of evaluating the products factor by factor.

Product Attributes

Thereafter, the questions attempt to obtain the consumer's reactions to the salient attributes of the products in order to discover points of superiority, or weaknesses that stand in the way of the consumer's preference and which might indicate a need for improvement through additional development work. Occasionally, we insert other questions to obtain information concerning consumer habits and usage related to the product. Of course, a stamped, addressed envelope for the return of the questionnaire is provided. The samples are forwarded separately via parcel post.

With the passing of the years, we have developed a deep respect for "the great American sweet tooth," and we have observed that even in catsup it could be catered to advantageously. Consequently, in the development of this product, we designed the formula for a mild spice effect against a sweet background.

Finally, adjustments had been made to the point where it was ready for our consumer testing. We then divided the Homemakers Reference Committee into two sections. With one, the new catsup was pitted against a nationally distributed product with a reputation for high quality. With the other it was compared to another nationally distributed catsup enjoying good acceptance.

General questions are on preference in color, flavor, and consistency or flowing property. These are followed by more specific inquiries about the "sample preferred" and "sample not preferred." Under the former, for instance, are lines for the Homemaker to fill in by check mark: "Mounded easily when poured on plate.....," "Poured easily from bottle.....," "Had a heavy pouring quality.....," "Had a light or thin pouring quality ....." Then, under "sample not preferred" are listed: "Too thick....," and "Too thin or watery....." Details on the container, along with appearance, easy handling, and the like, also allow for comments on such consideration as "Seems to hold more ....," "Not so easy to upset....."

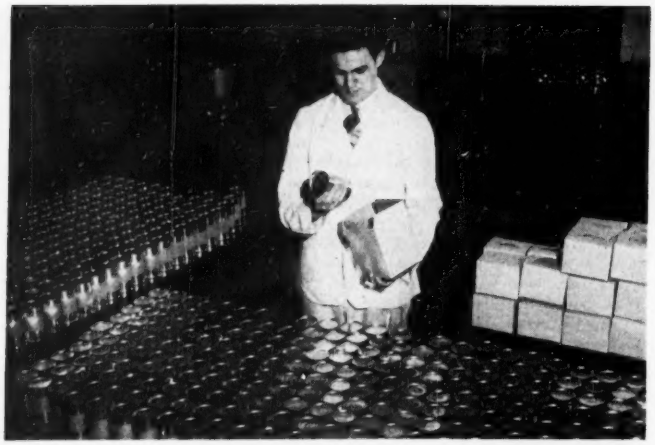
In the normal channels of distribution, this product has measured up fully to expectations on acceptance. The results of the test focussed our attention on the desirability of adjusting consistency, hence led us to specify upper and lower limits for consistency—initially as measured on the MacMichael Viscometer, and now in Bostwick Consistometer units.

We would not have you believe that we "ring the bell" with every test submitted to our committee. By way of example, mention may be made of a couple of tests involving sandwich spread wherein we have not yet attained satisfactory acceptance, but have been able to make progress in that direction by following the guid-

Proof of Improvement: Spread Vote Goes Up

TABLE—RESUBMISSION of Sandwich Spread to Homemakers Demonstrated That Company Was On Right Path In Its Work with the Product.

	Earlier Test (Initial Spread)	Later Test (Reformulated Spread)	Percent Rise
Overall preference			
Experimental	23.9%	39.9%	16.0%
Competitive product	70.1	50.3	
No preference	6.0	9.8	
Preferred Choice		Experimental / Competitive product	
A little more	...	61.8% / 57.5%	
Much more	...	38.2 / 42.5	
Appearance preference			
Experimental	8.5%	24.0%	15.5%
Competitive product	71.2	23.0	
No preference	20.3	53.0	
Flavor preference			
Experimental	27.6%	40.2%	12.6%
Competitive product	68.2	49.0	
No preference	4.2	10.8	
Consistency preference			
Experimental	8.8%	17.2%	8.4%
Competitive product	38.2	33.8	
No preference	53.0	49.0	



TEST and control samples sent to housewives must look as nearly alike as possible. Code numbers, at Krogers, have been largely replaced by colored bands.

ance furnished by the committee response. To summarize, we have tabulated the results of the two tests in parallel (see table, "Proof of Improvement"). In each case the experimental sandwich spread was compared with one conceded to enjoy wide and favorable acceptance. The experimental sandwich spread in the later test differed from the one in the earlier check-up in that an attempt was made to embody in it the deficiencies pointed out by the committee.

Substantial improvement was effected since, on overall preference, there has been a shift from the competitive to the experimental product. But it was not quite enough to win approval.

To determine the degree of preference the "Preferred Choice" was inserted in the later test. The response here is in harmony with the reaction on "Overall Preference" because it points out that the product preferred is a "little better" rather than "much better." Appearance was improved, chiefly through modification of color, to the point where preference on this score is no longer a factor, since more than half of the participants expressed no preference.

Reaction to flavor compared with that on overall preference shows a high degree of parallelism and emphasizes the dominant role of flavor in influencing preference. A little progress has been made toward improving consistency. There cannot be too much difference here, though, because the "no preference" vote is at the 50 percent mark. The results on the questions on flavor and consistency, in conjunction with some other reactions by the committee (not included in the present tabulation in the interests of clarity) suggest that additional progress must be made through further modification of the relish on flavor, fineness of chop, and proportion in the spread.

With mayonnaise, we were able to make progress to greater effect. In the first test, the committee indicated that the consistency of the experimental sample was too thin and that of the competitive product was too thick. The results in a later test showed that for all practical purposes we had bodied up the experimental product to match the competitive one. And as a side-light on the committee's dependability it should be noted that it then registered its opinion that the consistency of both products was too thick.

Reliable Evaluations

These examples should adequately describe how our Homemakers Reference Committee functions. We have found it valuable in guiding us in our product development work and as a judge of when a satisfactory result has been attained. Its decisions are respected and accepted by those in production and merchandising. Its approval of a product provides a means of reconciling individual, but dissenting, opinion to the viewpoint of the consumer.

The committee's judgments contribute to a psychological condition within our organization that commits all elements to the merchandising of an approved product with confidence, precluding loss of direction due to indecision or reservations concerning the product. Our experience generally has been that products winning the committee's approval have fared well at the hands of the consumer in the normal channels of distribution.

But very often special problems come up involving this acceptability testing—problems that do not lend themselves to handling by a group such as the Homemakers Reference Committee. Considering, for instance, our laboratories' interest in the evaluation of tenderness of beef, let us discuss the panel technic utilized to make these tests and some typical results obtained. The test, it may be noted, is particularly applicable to tenderness studies in that it is comparative and at the same time allows tenderness evaluation for each sample tested.

Usually we are concerned with effecting tenderization in beef, hence use is made of paired sides—(i.e.) one side of an animal is handled by the normal procedure (the control), while the other side of the same animal has been tenderized. Then steaks are cut from the short loins (same number of days since slaughter) to be used as the test specimens. In any given test, comparable steaks from the paired loins are used and, where a group of animals are involved, an equal distribution of right and left sides is observed between the "control" group and the "test" group.

Carefully Prepared

The test steaks are cut 1 in. thick. They are broiled under standardized conditions at 400 deg. F. to the "medium-rare" state. Three strips are cut from the center portion of each steak (two steaks of each per test) and arranged on plates in pairs corresponding to the "control" and "test" sides. The strips are properly coded, two pairs of codes being used so that no panel member has the same codes as members to his right and left.

The test plates are served to a panel of six judges, all cautioned not to comment verbally on any given test while it is in progress. The panel is instructed to record, on an appropriate form, which sample is preferred on tenderness and then to assign a tenderness value to each specimen according to the following arbitrary scale: 10, Very tender; 8, Tender; 6, Slightly tough; 4, Tough; and 2, Very tough. The judges are not restricted to the values given above but are permitted to score in odd numbers as they see fit.

Thus in a test, which is a typical example, the panel considered the tenderized meat more tender by a preference of slightly better than 5 to 1. They also indicate a 16 percent increase in tenderness was realized, on the average, in the tenderized sides. A shift of one full unit on the tenderness scale was effected so that the meat was improved from being dubiously tender (6.88) to becoming definitely tender.

We wanted to be sure that the members of the panel, as they acquired

experience, were not becoming too critical in noting differences in tenderness and that their mental standards with respect to the tenderness scale were not being similarly affected. We therefore paired these members with a randomly selected inexperienced panel. Then, on the tenderness preference basis, the inexperienced panel considered the tenderized sides more tender by an average vote of 5.4 to 0.6. The reaction of the experienced panel was 5.0 to 1.0 with the tenderized sides being preferred.

On the basis of tenderness values, the inexperienced panel's average values were 4.25 for the "control" sides and 7.0 for the tenderized sides. For the experienced panel, the comparable values were: Control sides, 4.25; tenderized sides 6.75.

Next, we wanted to know how the panel's results compared with objective measurement of tenderness. Employing a group of 16 animals with half of the sides tenderized and the other half serving as "controls," the panel was checked by using the Warner-Bratzler Shear or Tenderness Tester. Under standardized conditions, this machine measures the force required to shear a cylinder of the cooked meat of 1 in. dia., with the sample so taken that the length of the cylinder is parallel with the direction of the majority of muscle fibers. The shear force required is registered on a scale calibrated in arbitrary units from 0 to 75. The greater the reading, the less tender the meat. The machine in general paralleled the panel results. It appeared to be less sensitive to differences in tenderness than was the panel.

Next: Coffee

The old adage has it that "there is safety in numbers." We have applied this principle to our work with coffee, and to good effect. Everyone considers himself a good judge of coffee; unfortunately, however, everyone does not agree on what constitutes good coffee. Even the expert who is regarded as entirely competent to evaluate coffee as to grade, type and flavor character, is not always competent to speak for the consumer.

It is for such reasons we have developed a double-panel check on coffee after our procurement and production departments have teamed up to turn out the finished product. The result, constituting the composite reaction of ten individuals, serves as a guide for buying and for blending as well as for adjusting the roast.

Our experts first purchase the green coffees, and they make use of the standard cupping test so universally applied in the trade. These experts then set up recommended blends for consideration by the roasting plants. In establishing these blends, the cupping test is again employed.

The roasting plants, by means of their own cupping tests, review the recommended blends and then generally proceed with them—unless in their opinion some revision is desirable. Here, too, a great deal of cupping is done in adjusting the roast and setting up standards. There then follows the routine cupping tests by means of which inspection on the out-turn of coffee is maintained.

In addition to this, our laboratories procure at the point of retail sale, each week, samples of three grades of coffee our plants produce and, along with them, samples of the chief competitive coffees in the three categories—vacuum packed, medium-priced bag, and lower-priced bag. Each week, both of our roasting plants are represented, and over intervals the samples are so obtained that we cover our entire retailing organization in coffee testing operations.

By means of the standard coffee cupping method, the three groups of samples are checked by a panel of five. We make it a point never to have more than six samples in any group. The panel members are called in one at a time and are required to note their order of preference for the coffees, in any individual group, on an appropriate form. In addition, they are required to describe the dominant character of each cup.

(*Turn to page* 165)

Special Letters Spark the Tests

On Catsup . . .

Dear Committee Member:

We send you, next, the product that's a year-'round favorite as a tongue-tickler—Tomato Catsup. What an enlivener for thick steaks, juicy hamburgers, sizzling pork and beans! We're checking up on catsups in all ways, and the two samples now on their way will give you a chance to do some fancy judging.

Flavor is of prime importance. Catsup color counts. So, you'll look over both samples carefully, and taste 'em back and forth. You'll also test how they pour. (Ever had an experience with too free-flowing catsup or the "stubborn" type?)

Of course, anything which is picked up as much as a catsup bottle needs "hand" appeal too, hence we've tossed out a few questions concerning bottles themselves.

Please give us the answer, Catsup Connoisseurs!

Very sincerely yours,
Jean Allen

On Coffee . . .

Dear Committee Member:

In the unassuming container now on its way to you is packed—a New Experience!

You are about to launch upon a brief career as a "coffee-taster." The carton contains the most necessary props: Samples of two "soluble" coffee products with a measure. Make up the cups as directed, add some fixin's if you take it that way, and start sipping.

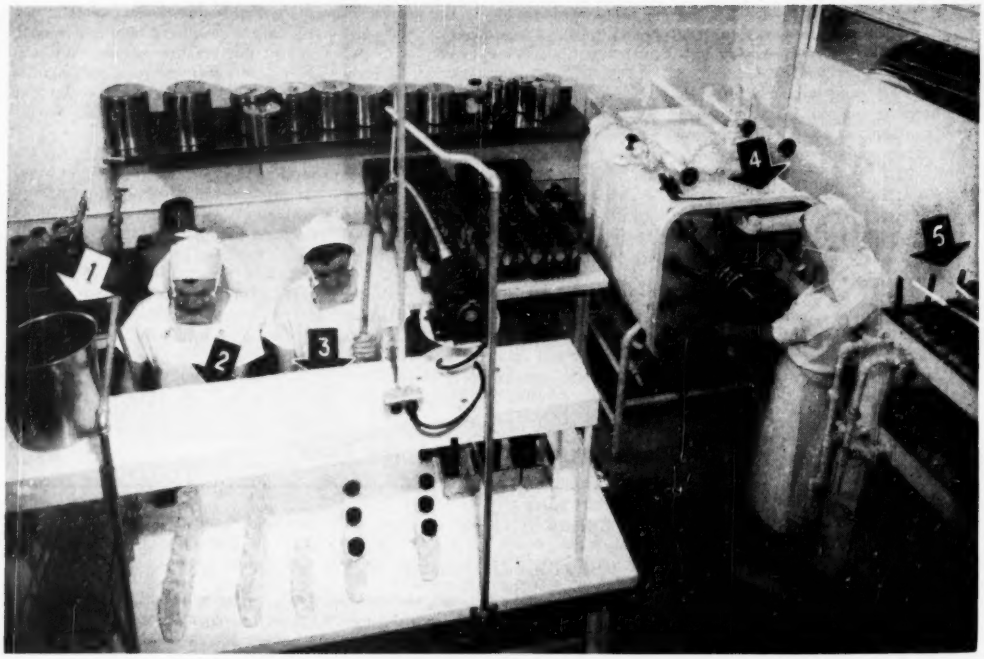
Here's an extra be-sure-and-do direction: Taste the two samples back and forth. In other words, after you've tasted both, take another sip of the first, another sip of the second, and so on until you establish your preference.*

Then go on the record (sheet attached) and mail immediately to the expectant record-keeper.

Very sincerely yours,
Jean Allen

*** This, by the way, is a good idea on *every test*—just to make sure you aren't unduly influenced by the one you taste *first!***

ALONG WITH samples and questionnaires go informal letters designed to catch and hold housewife's interest and guide her in product-evaluating procedure.



MANUFACTURING LABORATORY of company, where registered nurses: **(1) Compound formulas; (2) fill sterile** bottles; (3) automatically screw on caps; (4) sterilize bottles in autoclave; and (5) allow bottles to cool in trays.

Made-To-Order Infant Formulas

Coast Processor Is Making Them a Success

—by providing responsible service to hospitals, homes and travelers with product individually compounded from doctors' prescriptions

C. R. HAVIGHORST
Associate Editor, "Food Industries"

Sterile infant formulas in bottles, compounded from doctors' prescriptions, are now being successfully produced commercially by Baby Formulas of San Francisco.

Heretofore, in hospitals, these formulas were hand-prepared by student nurses under direction of a registered nurse. And, at home, mother prepared her child's formula in the kitchen. Now, a mother can buy her infant's individually prescribed formula and have it delivered to her door every second day. Current price is under $5 per week.

The need for commercial production of baby formulas parallels that felt some years ago for canned baby foods. The everpresent hazard, in hospitals, of epidemic diarrhea and of cross-infection means setting aside additional floor space, and the expert use of terminal heating technics. These requirements, in an average-size hospital, are costly and often impossible to fulfill. A centralized formula-producing plant immediately provides the sterility required, eliminates the hospital's need for investment in space or equipment.

Similarly, the mother at home is sure of this same security for her infant's formula while saving the time she formerly devoted to its preparation.

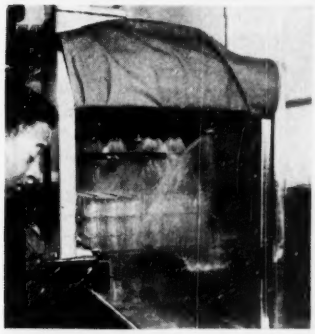
Henry M. Pollock, M. D., formerly with the Boston Massachusetts Memorial Hospital, was the first to apply the terminal thermal sterilization technic, used generally throughout the canning industry, to the bottled infant formula and, also to the caps and nipples.

It is recognized that the hazard of infection does not develop from the ingredients used in formulas, for these are usually 99 percent sterile. However, the handling necessary in compounding the formula can bring about the contamination in this very susceptible culture media.

The American Hospital Assn. sets a maximum tolerance for infant formulas at 25 bacterial colonies per milligram. Regular analyses of this company's baby formulas show only 2 out of 1,000 that may have a bacterial count of 20 colonies or more. The remaining 998 have been termed absolutely sterile.

In the field where out of 45 firms, only 15 now survive, and of these

Close-Range Views: Washing, filling, capping



AFTER SOAKING, empty bottles are cleansed in this converted dishwasher.

BOTTLES are vacuum-filled with formula from overhead supply tank.

CAPS are automatically screwed on over inverted, pre-sterilized nipples.

only a few are financially successful, Baby Formulas' progress is due largely to the vision and ingenuity of the husband-wife combination, Mr. and Mrs. Edward Wenner. Their first month in business (June 1947) showed one customer and an estimated loss of $30 per day. Now, however, they have run their original investment of $10,000 into a paid-in capital of more than $47,000.

The company serves nine of the San Francisco Bay Region's hospitals, and it estimates that its product goes to one-third of all infants born in this region. In addition to the hospital trade, it serves, by two delivery trucks, over 600 infants at home, delivers formulas to hotels, and supplies "Travel-paks" on order. Production now has reached more than 6,000 bottles of formula each day, and dollar volume is over $15,000 a month.

Process, Equipment Described

Two series of wire baskets, one size for 24 4-oz. and one for 14 8-oz. bottles, are used throughout the processing and delivery operations. The bottles fit firmly in square spaces made by the wires. The basket of 4-oz. bottles, hospital pack, is sufficient for a 24-hr. supply for four infants. The 14 8-oz. pack is a 48-hr. supply for an infant at home.

Empty bottles are picked up by the truck drivers and returned to the company's bottle washing department. Here, a perforated metal lid is placed over sets of the bottles to hold them submerged. They go into a tank of 165-deg.-F., 3½ percent caustic solution and soak for about 20 min. They drain outside the tank, and with the perforated lids still covering them, are slid, upside down, into the bottle washer and sterilizer. There they are sprayed on the outside and inside with a detergent solution.

The machine employed is a regular commercial dishwasher adapted for this type of bottle washing.

Proteins or fats that were baked or dried inside and outside bottles are removed by the physical action of the water-jets. Chemical action decreases the surface tension around these particles so the water can wash the bottles clean. Final rinsing with 180-deg.-F. water completes the cleaning.

Strength of the detergent solution is automatically controlled. The operator has only to position the bottles in the washer and push the button that actuates the pumps. Bottles are cleaned with detergent for about 45 sec., then an automatic relay switch shuts off the detergent solution and opens the clear hot water valve. Bottles are rinsed with clear water for 15 sec. The unit will wash 48 bottles per min. or about 3,000 per hr.

Nurses Fix Formulas

Three registered nurses compound the formulas in the laboratory. Personal asepsis is maintained by surgical technics. Other laboratory precautions include germicidal lamps and air purification by forced ventilation that filters air through glass wool filters. Air is completely changed in the laboratory 2½ times a min.

There are 100 or more ingredients used in formulating, but about 90 percent of all infant formulas are prepared from three basic materials: Water, milk (fresh, evaporated or dried), and carbohydrates. Except for water, there are about 12 proprietary brands of each of the other two products. Number of potential formulas that can be prescribed by doctors varies with the possible combinations and dilutions of these materials. Since the product and container are thoroughly sterilized during the process and doctors are experienced with formulas made from city tap water, no distilled or well water is used.

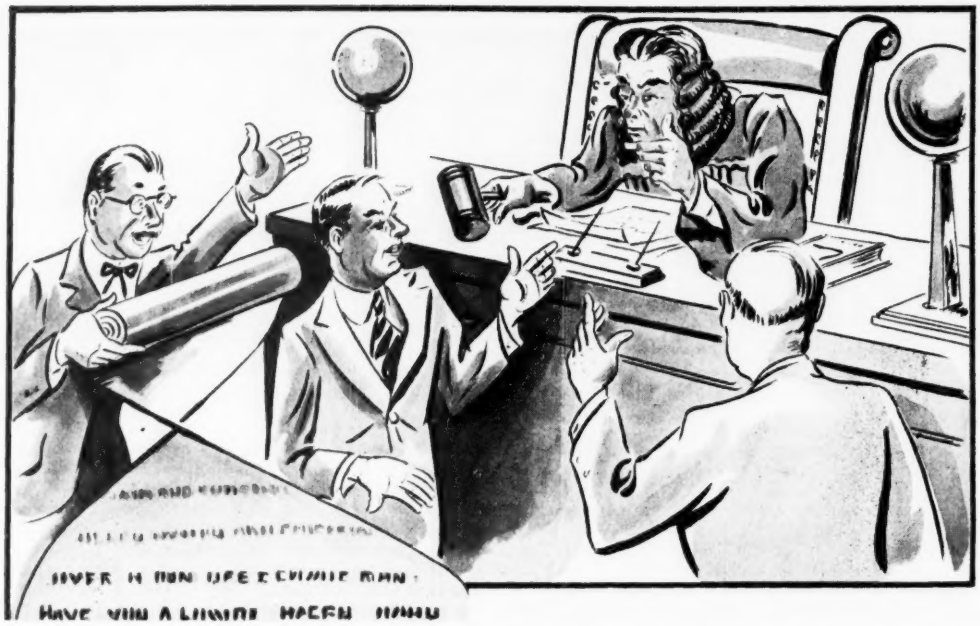
For healthy newborn infants, there are about 12 infant formulas that are uniformly standardized. About 90 percent of all hospital-born infants are fed these formulas. Up to 2-3 gal. of each kind are formulated by the company and filled into bottles with a vacuum filler. Premature and underweight infants (weighing less than 5 lb. 6 oz.) require special formulas, heavy with protein. These are usually produced in quantities of 32 oz., and are filled into bottles from the containers in which they are formulated.

Filled and capped bottles are code-marked with rubber bands around the necks. They are placed in a 24-basket autoclave. Steam is bled from it for 5-11 min., depending on size of load. The steam enters at 40 psi., temperature approximately 270 deg. F., and bleeds through a condensate valve until an atmospheric temperature of 250 deg. F. is established. A pressure reduction valve then automatically adjusts the temperature to about 235 deg. F. at 7 psi. Product is held at this temperature for 13 min., then steam cuts off and bleeds from the autoclave. Unloading takes 8 min.

The baskets of sterilized, bottled formulas are then placed in the cooling trays. Water at 180 deg. F. is first introduced into the trays and, as it reaches a 2-in. depth, it is shut off and cold tap water substituted. The trays have a standpipe for water overflow. Product is left in these trays for 15-20 min.

The baskets are then wrapped in heavy kraft paper and sealed. Now ready for delivery, they are stored at 40 deg. F. until loaded on the trucks. Homes and hospitals are serviced.

To obviate the growth of some undesirable molds that formerly occurred when tap water was used to moisten the gummed tape, a .002 percent solution of quaternary ammonium disinfectant is now used.



What is legal in protecting a color scheme?

When is fit-to-eat food "adulterated"?

Where does intrastate commerce actually begin?

Which party is responsible for quick-spoiling goods?

Who must bolster evidence when a package injures a consumer?

Why comply with laws of the other man's state?

Court Decisions Give Tips On Avoiding Legal Tangles

In these 12 meaty briefs of recent cases, the spotlight is on the principles behind the rulings—which you should mentally note against the "day when"

LEO T. PARKER
Attorney-at-law, Cincinnati

Of pertinent concern to every food processor are the significant court decisions relating to his industry—particularly the rulings in those cases that he recognizes "might happen here in my operation."

Certainly, a food man can't station a lawyer at every step in his company's operation. But he can do the next best things: Keep an eye on representative legal decisions and guide his actions accordingly.

As the saying goes, forewarned is forearmed. And in line with this moral here are briefs of 12 of the most recent higher court decisions, each numbered as an aid to future reference.

1—When Color Schemes Can Be Protected

Considerable discussion has arisen over the legal question, "When is color a valid (protected) element of a trade-mark?" Answer: "Only when it is used in combination with a design, such as a picture or geometrical figure."

In *Campbell Soup Co. v. Armour & Co.* (175 Fed. 2d 795), the former filed suit for damages and asked the court to grant an injunction preventing the defendant from using a red and white label on its food products.

Counsel for the plaintiff contended his client had exclusive right to use the color combination of white and red on its labels. But the higher court refused to hold in favor of the soup company, saying:

"What the plaintiff is really asking for, then, is a right to the exclusive use of labels which are half red and half white. If he may thus monopolize red, the next manufacturer may monopolize orange, and the next yellow in the same way. Obviously, the list of colors will soon run out. That a man cannot acquire a trade-mark by color alone has been stated a good many times in decisions."

For comparison: *In Pacific Coast Condensed Milk Co. v. Frye & Co.* (147 P. 865), the court said, "The primary colors are few and, as the evidence shows, those suitable for light products, such as milk, are even more limited. To allow them to be appropriated as distinguishing marks would foster monopoly by foreclosing their use by others."

For further comparison: *In Heddon's Sons v. Millsite Works* (6 Cir., 128 F. 2d 6), the court held that color is a lawful element of a trade-mark if it is used in combination with a distinctive design.

2—Stops Salesman's Jump to Competitor

A contract is valid in which a salesman of processed food agrees not to accept employment with a competitor for a reasonable period of time.

In *Renwood Food Products, Inc., v. Schaefer* (223 S. W. 2d 144), it was shown that defendant was employed under

a written contract in which he agreed not to engage in distributing frozen foods, or in any competitive business, within the trade area served by the plaintiff for one year from termination of his employment.

Schaefer violated this agreement and the company filed suit. The higher court ordered Schaefer to not breach the contract, saying:

"The restrictions of the contract sought to be enforced in this case are limited as to time, namely, for a period of one year from the termination of defendant's employment. This limitation is, in our judgment, entirely reasonable under the facts and circumstances in evidence . . . It is our conclusion that the plaintiff is entitled to the equitable relief sought."

3—"Adulterated" Even Though Fit for Eating

A food is "adulterated" if it contains filthy or decomposed matter, even though it is fit for human consumption.

In *United States v. Sala Packing Co.* (165 Fed. 2d 205), the Government, pursuant to 304(a) of the Federal Food, Drug, & Cosmetic Act, instituted action in respect to certain cases of canned tomato juice shipped in interstate commerce. Sought was condemnation of the juice on the grounds that it was adulterated, since it contained decomposed tomato material. The processor denied that his produce was "adulterated" from a legal standpoint, contending it was "neither harmful nor poisonous, but good and safe for human consumption."

The higher court ordered destruction of the juice, saying: "The statute means that food which contains filthy, putrid, or decomposed matter is to be deemed adulterated, whether or not it is fit for food."

4—Cooperation Saves Money

A company which fails to cooperate with Government agents in segregation and examination of condemned food products automatically forfeits its bond. Also, the fact that foreign countries permit a higher tolerance than does this country, does not mean that processed food condemned in the U. S. can be withdrawn from Government agents and thereafter shipped abroad.

In *Stinson Canning Co. v. United States* (170 Fed. 2d 764), the litigation involved several lots of canned sardines that were subject to a fungus disease on which the Pure Food & Drug Administration allows a tolerance of only 5 percent. The lots were seized by Government agents, who advised the canner that they were ready to supervise the segregation or destruction of the sardines. The company, however, failed to cooperate in this respect during the following six months.

Canning company officials believed the sardines would come within the higher tolerance permitted by certain foreign countries, and thus that the fish could be shipped out of this country. Company's counsel asked permission to take possession of the sardines from U. S. Government agents for shipment abroad. The higher court refused to grant this request, saying:

"The policy of the Food & Drug Administration is to oppose permission to export goods which have been declared unfit for shipment in interstate commerce, on the theory that such permission would encourage negligence on the part of packers . . ."

The court then held that the canning company could repossess the condemned foodstuff upon posting a bond, thus giving the company an opportunity to segregate good cans or cases from those containing diseased fish.

The bond was furnished by a bonding company, guaranteeing that the canning company would comply with the decree of the court. It was later ordered forfeited because the testimony showed the canner did not cooperate with the Government in segregating the good cases from those which diseased fish were packed in.

5—Interstate Despite Local Handling

There has been discussion from time to time over the question, "If a seller assembles orders of several purchasers in a state, and ships all these orders, in a single car, to its agent who then distributes the merchandise to the purchasers in the foreign state, does the seller transact intrastate business in the foreign state?" The answer is: "No."

In *Rodgers v. Howard* (219 S. W. 2d 240), testimony showed that a traveling salesman of a soup company took a number of orders from purchasers in Arkansas. Upon acceptance of these orders at the company's New Jersey office, the shipments were packed and marked for the respective purchaser. Shipments were made in carload lots to a local company at Texarkana, Ark., which opened the car and then sent purchasers their shipments. In short, the local firm broke the shipment to less-than-carload lots—evidently to save on freight.

It was contended that the soup concern was "doing business" in Arkansas, and therefore subject to taxation and other laws of this state.

The higher court refused to agree saying that where a foreign corporation accumulates several shipments into one carload shipment, and an agent of the corporation distributes the individual shipments to the various purchasers, such shipments are interstate commerce and does not constitute "doing business" in Arkansas by the foreign corporation.

6—Temporary vs. Permanent Danger

A plant owner can without liability, hire minors to work in a temporarily dangerous packing plant.

In *Henri v. Rocky Mountain Corp.* (202 Pac. 2d 727), it was shown that a state law prohibits the employment of minors under 18 years of age in a place dangerous to "health, property, or welfare" of minors. In a seeming violation of this law, the minor was employed to work in a packing plant, which was in a temporarily dangerous condition. He was injured.

The higher court refused to hold the employer liable because the injury was caused by the temporary dangerous condition. The court said:

"Of course, any place of employment, not intrinsically or inherently dangerous, might become, in a sense, temporarily dangerous, as a result of negligence on the part of the employer or one of his servants. But this is not the sort of place in which the legislation intended to prohibit the employment of minors."

7—Food and Ads "Together Though Apart"

Recently, the Supreme Court of the United States held that separate interstate shipments of food products, and of leaflets or advertising matter, constituted a *single* interrelated business transaction. Hence, one who separately ships false or fraudulent advertising matter violates the Food, Drug & Cosmetic Act.

In *United States v. Urbuteit*, (69 S. Ct. 840), a condemnation proceeding was instituted by the U. S. under the Act. It was revealed that the products had been shipped in interstate commerce and leaflets describing the products had been shipped at a separate time.

The Supreme Court held that the seller was liable to the same degree as if he had shipped the leaflets with the product.

8—First Order Legal Factor in Second

A purchaser may, without any liability, cancel a second order for processed food if, after signing the second contract, he discovers that the food delivered under the first contract was inferior.

Burcham v. Caprio (210 Pac. 2d 877) concerned a com-

pany that purchased a carload of pickles from a packer, through a merchandise broker. Later, the company purchased two more carloads of pickles. Soon after this last contract was signed, the company's official discovered that the first carload was of inferior quality and not up to the standard of samples.

In subsequent litigation the higher court held that the company was justified in refusing to accept delivery of the second order.

9—Double Trouble With Doubled Contracts

Where a seller of food products breaches a contract he is liable to damages, and if he makes a new or compromising contract with the purchaser respecting the same merchandise, the purchaser may base his suit for breach both on the first and second contracts.

In the case of *Crown Products Co. v. California Food Products Corp.* (175 Pac. 2d 861), a buyer contracted to buy, and a seller to sell, "during each of the years 1941, 1942 and 1943, a total of not less than 300,000 gal. and not more than 400,000 gal. of 59½ grain cider vinegar." The contract provided that "the price of this vinegar shall be 5c. a gal., less 2 percent for payment within 5 days from shipments." After a few months, the buyer and seller agreed *orally* that the price should be changed to 6c. a gal. And in 1942 they agreed orally that the price should be 7½c. a gal. However, at no time during the contract period did the seller deliver the quantity of liquor which he contracted to.

The buyer told the seller that he did not desire litigation, and that if the seller would deliver at 7½c. a gal. the full 350,000 gal. called for by the contract for the 1943-1944 period, the buyer would waive the past defaults. In August, 1943, buyer and seller made a written contract to this effect. Then, only a few weeks later, the seller told the buyer that he would not make further deliveries unless the buyer agreed to increase the price to 10c. a gal.

The buyer sued the seller for damages based on *all* short deliveries made during 1941 through 1944. Testimony showed there was little or no vinegar available on the open market from August, 1943, to September, 1944, and that the retail price of vinegar had gone up to 20c a gal.

The seller argued that the purchaser could not recover damages for non-deliveries during 1941, 1942 and 1943 because the new contract, made in August, 1943, cancelled the seller's liabilities for prior breaches of the contract.

However, higher court held the seller fully liable to the buyer for delinquent deliveries in 1941, 1942, 1943, and 1944. The court explained that making the new contract in August, 1943, did not excuse or relieve the seller from damage liability for past breaches, since no clause was inserted in the new contract to this effect.

10—Lack of Inspection Assumes Acceptance

If a buyer receives processed food and fails to inspect it within a reasonable time, the law assumes that he *automatically* assented to keep and pay for the merchandise. This is so even though the food may be unfit for human consumption.

Testimony in the case of *Kulber v. Fairmont Creamery Co.* (80 N. E. 2d 246) concerned sale by the Star Fish Co. and the Fulton Fish Co. of a large quantity of processed shrimp.

Purchaser attempted to rescind the contract and avoid liability on the grounds that when he re-sold some of the shrimp, his customers returned the shrimp as being unsatisfactory and unfit for human consumption. The purchaser proved that the seller expressly warranted the shrimp to be "first class."

Further testimony showed that at no time did the purchaser examine the shrimp to find out whether it was "first class." Thus, purchaser was negligent in failing to inspect the merchandise. In holding that the purchaser could not rescind the contract and that he must pay the full contract price, the court said:

"The evidence discloses that unless processed shrimp is kept at relatively low and constant temperatures, it is highly perishable. A reasonable time within which to examine the shrimp after receiving it would be a *very* short time . . . The plaintiff (purchaser) did not act with reasonable dispatch to determine the condition of the shrimp on the date of delivery."

11—Interval Vital in Consumer Case

The law implies that explosion of a bottle or can of food products results from negligence of the processor if he fails to prove that the cause of the explosion may have arisen after it left his plant.

In *Coca-Cola Bottling Co. of Fort Smith, Ark. v. Hicks* (223 S. W. 2d 762), a consumer was seriously injured when a bottle exploded in her hands. The higher court awarded the consumer damages in view of evidence that she was not guilty of contributory negligence and that no independent causes intervened to break the bottle. In other words, the court decided the bottler was negligent in filling, charging, capping or otherwise preparing the bottle.

This court also explained that the processor would not have been held liable if he had introduced some evidence that the bottle exploded because of a cause which intervened between the time it left his hands and when it exploded. The court said:

"To make certain that the injury has not been caused by somebody else, through some intervening negligence, it is ordinarily required that the instrumentality causing injury be in defendant's (processor's) exclusive possession and control up to the time of the plaintiff's injury. That requirement appears to have been satisfied when the plaintiff shows that there was no opportunity for the content or character of the charged bottle to have been changed from the time it left defendant's hands until it exploded."

12—Comply With Other State Before Suit

A corporation cannot file a suit in a foreign state, unless it has fully complied with the laws of that state.

In *Cities Co. v. Associated Co.* (191 Pac. 2d 650), it was shown that an Oregon state law clearly provided that a corporation located in another state and "doing business" in the state of Oregon must file certain papers showing the location of its principal office and other pertinent data, and also identifying its agent in Oregon to the state officials.

Here, a company located in another state sued a buyer in Oregon to recover money due for purchased products. Since the company had not complied with the above law, the higher court held that the suit could not be maintained. The court said:

"Whether a foreign corporation is doing business in this state does not depend upon the number of transactions that it has, but upon the nature and character of the transactions."

And speaking of state laws, modern higher courts consistently hold that those which require food products to be inspected are valid and enforceable.

In *Cole v. Lindsey* (211 Pac. 2nd 544), litigation involved a state law which related to inspection and grading of fruits and vegetables. The higher court upheld validity of the law, stating its purpose is to prevent sale and shipment of any fruits and vegetables that are not in a wholesome and fit condition for human consumption.

And a thirteenth tip: The Chinese, it's said, pay their doctors for *preventing* illness. Your food business would profit by applying the same principle. These digests of court cases provide the know-how.

Copy gets better play in "seamless" layout ↓

OLD Sicks' can (left) looks small and **cluttered compared to clean-cut redesign (right). And new container** incorporates layout innovations yielding more effective printing area and a seamless illusion. Top is utilized, too.

New Concept in Beer Can Label

"All-around" readability achieved by unique layout. And redesign reaps more sales dollars for Sicks'

SEEKING greater self service store drawing power, Sicks' Seattle Brewing & Malting Co. recently introduced an unusual beer can layout plus revitalized artwork for both can and bottle. And a marked sales increase has followed.

Created by Walter Landor, San Francisco industrial designer, the new beer can label goes three steps further than most containers of its type: (1) It gives the impression of being seamless, (2) it has increased printing area, affording extra selling space, and (3), its top, usually neglected, has been utilized for even more selling copy.

Because printing ink cannot be applied to a soldered seam, the focal points of most beer can labels are centered directly opposite the seam. Secondary space is thus split on both sides of this main element.

But, contended Landor, people read from left to right and tend to turn a package accordingly. So the focal point of this brewery's new label is placed directly to the right of the can seam. This printing layout gave the "seamless" illusion, and provided new possibilities for effective selling copy over the rest of the can surface. Currently, the added area carries a personal message from the company's president.

Other details also add to the appeal of the can. Diagonal gold and maroon lines set off the label area and give the can better massing power on shelf displays. The mandatory legal information, fully legible, has secondary position, so that it does not clash with the basic pattern.

The actual redesigned label, on both cans and bottles, is less cluttered than the old one, but it does not scrap the basic "recognition" elements. The numeral "6", pronounced same as company name, is brought to the fore with added impact. The words "Sicks' Select" are set in a delicate scroll across the lower part of the "6", remedying the conflict of elements on the old label. A hint of old world heritage is conveyed by printing the brand name in easily-read Germanic-type lettering.

In addition to upping sales, the new label has garnered a number of prizes. Recently, the Reynolds Metals Co. Gold Medal was presented when the label was judged the most outstanding foil unit at the Second Annual Exhibition of Advertising Art at San Francisco.

BOTTLE, also has prize-winning redesign (left), sells faster than did old (right).

WHEN THE "MILK MAN" can deliver an acceptable product here, many problems will have been licked.

What Military Wants in Milk Products

More stable beverages and bread spreads, made from milk, other oils and fats, must be developed if varying needs of Armed Forces are to be met

AMANDUS J. BOYER
Dairy, Oil & Fat Products Div., QM Food & Container Institute for the Armed Forces, Chicago

Feeding the Armed Forces during the fast-moving operations of modern times means designing rations and ration components that are:

- Economical of shipping space and weight
- Easy to prepare and eat, and hence non-hampering to the progress of other necessary activities
- Adapted to extremes of climate and harsh terrain
- Pleasant to the taste
- Adequate to bodily needs

Dairy, oil, and fat products can often be fitted to these diverse and exacting military requirements in very high degree. Owing to the nature of the products, however, many problems must be defined and solved if full military use is to be made of the item. The perishability of the basic product, fresh milk, is carried over in varying degree to all processed milk products.

A dismaying number of things can happen to milk-derived foods—bacterial life flourishes in the medium; deteriorative changes, causing off flavors and odors, occur suddenly and mysteriously; and texture changes, such as "chalkiness," are induced by such processing procedures as dehydration. Reliquefying dry whole milk fails to produce the smooth fresh-tasting beverage desired.

Need Beverage Milk Ingredients

Dried milk products save space in shipping and storage. If the products meet the requirements of stability, ease of reconstitution, and acceptability, they are among the most desirable of all ration components used by the Armed Forces.

The specific need is a product which, after storage for six months at 100 deg. F., will reliquefy readily with manual stirring and will closely simulate fresh fluid milk in appearance and palatability. This need for a beverage milk in military feeding operations remote from a fresh supply has long been recognized by field observers. Dry whole milk is produced primarily for civilian consumption. If used within one month after production, it will reliquefy satisfactorily—but mechanical equipment must be used. Such equipment is not easy to provide in the field. The reliquefied product is palatable, however, and useful for group feeding in localities where the necessary facilities are available and refrigeration for thorough chilling is also present.

Despite palatability, the product fails to simulate fresh fluid milk because of chalky film that remains on the drinking vessel after emptying. Furthermore, palatability decreases with storage because of the intensification of the chalky flavor and the development of stale and, occasionally, tallowy or rancid flavors.

Hence, for the purpose desired, there is no product suited to individual use under field conditions. A product that will disperse in 1 min, in water at a temperature as low as 40 deg. F. must be developed. The key objective in the search is a method for improving dispersability to allow utilization under the conditions of mobile operations. Extended shelf life is also required if use by the Armed Forces is to be practicable.

In the absence of a completely satisfactory whole milk, attention has turned toward preparation of a satis-

factory beverage milk from the separated ingredients—fat and non-fat solids. For this purpose, non-fat milk solids suitable for beverage purposes are required. The specific need is for information as to the effect on the product of heating during processing.

Anhydrous milk fat, non-fat dry milk solids, and water can be combined into a milk beverage where facilities for recombination are available. But the quality of recombined milk is closely related to the quality of the original ingredients. Since the bulk of the non-fat dry milk solids produced is intended principally for baking purposes, they are not satisfactory for beverage use. The excessive heat treatment they receive is the chief reason for this failure.

However, development of methods for control of heat treatment of non-fat dry milk solids for beverage purposes has largely been accomplished and made available. This project now has moved into the stage where an evaluation of existing methods is possible. Members of industry who are familiar with these methods and whose laboratories are using them today for the evaluation of products of their own company are aiding the Institute in this task.

Canned Beverage Milk

Milk products suitable for beverage purposes can also be used under conditions in which fresh fluid milk is not available and in which water, time, and facilities for reconstituting a dehydrated product are lacking.

Requirements are for a palatable, flavored or unflavored sterile milk with a storage life of at least six months at 100 deg. F. and unaffected by freezing temperatures. The value of such a product in situations where the tactical demands prohibit rehydration of a dry whole milk is apparent.

Evaporated milk is not suitable for this purpose, since its cooked flavor and the necessity for dilution militate against its use. An unflavored, flash-sterilized product has shown a storage life approaching that desired, but the stability is variable and the product is available only in glass. A canned caramel-flavored milk has been shown to meet the requirements, but it is not available as yet in the quantities that would be required. Chocolate or chocolate-malt flavored milks—provided the chocolate is non-settling or easily resuspendable—will meet the need. A number of available products are being investigated.

Sterilized Cream

Another product offering possibilities for use as a source of fat for recombined milk is sterilized cream. Less susceptible to stale flavor than is dried whole milk, and less sensitive to deterioration at high temperatures than is butteroil, it is a promising source of fat for the beverage-purpose milk desired.

Specific Needs

In dairy, oil, and fat products are:

1. Beverage milk ingredients
2. Canned beverage milk
3. Sterilized cream
4. Dehydrated milk fat
5. Canned butter
6. Canned margarine
7. Stable bread spread
8. Canned milk
9. Improved specification tests

A sterilized 30 percent cream, which will have a storage life of not less than six months at 100 deg. F., is the product specifically sought.

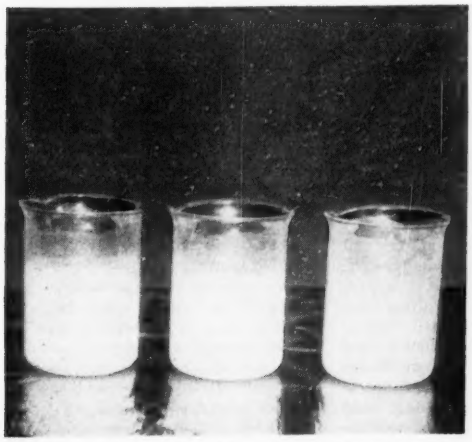
We have said that anhydrous milk fat is used successfully as the fat source when necessary homogenization equipment is available. If no equipment is available for recombination, the fat source should be cream concentrated to at least 30 percent fat to eliminate shipment of excessive quantities of water. Cream containing 18 percent butterfat has a reasonably good storage life, but 30 percent cream shows separation within two to four months, as evidenced by "cream plug" and/or separation of free fat. A 30 percent cream showing improved physical stability is required.

Dehydrated Milk Fat

The dehydrated (and purified) milk fat commonly known in commerce as butteroil (though perhaps more accurately described as anhydrous milk fat) has potential uses of great interest. It appears to offer a means of furnishing fat of controlled quality and reasonable stability (under the proper conditions) for preparation of palatable milk by recombination with dried non-fat milk solids and water. It is also of potential usefulness for preparation of spreads for bread. Thus, it is one of the basic ingredients for the preparation of two of our most popular and most necessary dairy products.

The development of a milk fat which will have a storage life of two years at 70 deg. F. is the objective of the Armed Forces.

Recombined milk prepared from anhydrous milk fat, non-fat dry milk solids, and water is now being sup-



FRESH liquid milk (left) leaves no chalky film. Center: best powdered milk obtained so far—slight film. Right: The usual commercial powdered milk—heavy film.

CRITICAL taste panels at QM Food & Container Institute check on appearance and palatability of milk products for field use. Author is wearing white coat.

plied to troops overseas in areas where facilities for recombination are available. Although the anhydrous milk fat used is satisfactory, it requires refrigeration during shipping and storage. A fat that can be shipped and stored with no refrigeration is what the situation really requires. Work toward this end is being encouraged.

The project has been referred to interested government agencies for investigation, since it is doubtful that industry would have more than a general interest in a so highly stabilized product.

Better Specification Tests

Another problem involving dry whole milk hinges on the need for additional specification tests supplementing the standard grading procedures. Such tests would permit selection of currently available products with the greatest acceptability and long storage life.

Grading procedures for dry whole milk are based largely on "solubility index," moisture, oxygen content of the headspace gases, copper, iron, and sediment determinations. These procedures group the available products into broad quality groupings, but are not precise enough to differentiate the superior products from marginal products within a group. Although the grading procedures now in use provide data on factors pertinent to storage life, prediction of acceptability of products after six months' storage at 100 deg. F., on the basis of grade, is not satisfactory for military purposes, where much greater precision is desired.

More precise information on the effect of heating during processing on the susceptibility of the product to staling and oxidation and on solubility should lead to more accurate indices of acceptability and potential storage life. The value of such indices to the Armed Forces should be abundantly clear.

At present, projects pertinent to dry whole milk are under study by the Coordinating Committee of the American Dry Milk Institute. The problems involved are strictly basic, and their completion will involve a long-range program. Since no known chemical methods are sensitive enough to detect changes in dry whole milk before such changes become apparent to the taste, the studies now being undertaken by this committee, as well as by research workers associated with the Institute's program, are being watched with great interest.

Use Canned Butter

Attempts to supply the equivalent of fresh butter in a more stable form quite naturally begin with the application of the most familiar process of preservation—canning. Success in canning would appear to be a simple answer to the problem of supplying a palatable spread for bread. But to provide a palatable canned butter with a shelf life of at least six months at 90 deg. F. and emulsion stability at −40 deg. F. (the Armed Forces requirement) is not easy.

Previous experience with canned butter has been generally unsatisfactory because of rapid deterioration of flavor unless refrigerated, regardless of the original score of the butter. Score alone, in fact, may not be a precise indicator of susceptibility to deterioration. Developing butter suited to military conditions of use will be largely of Armed Forces' interest, since the requirements specified by the project are such as to call for basic modifications in butter itself.

Butter manufacturers using the continuous process, however, can contribute much to the development of a canned butter meeting the QM requirements. Several products from these sources have been forwarded to the Institute and are now being evaluated as to their military characteristics.

Canned Margarine

Usually a blend of straight milk and hydrogenated oils, margarine can be hardened to any melting point desired. When military need for a spread with more stability than butter became evident, use of a margarine spread under special military circumstances was among the first projects investigated. Tests have indicated that when flavor alone is the criterion, samples of margarine compare favorably with butter. The keeping qualities are improved by adding preservatives permissible by law. The caloric value and coefficient of digestibility are approximately the same as those of butter. Vitamins A and D can be added to margarine to improve its nutritive qualities.

For Armed Forces use, however, a palatable canned margarine with a storage life of at least six months at 90 deg. F. and emulsion stability at −40 deg. F. is desired. These requirements exceed those needed to meet domestic commercial demands on the product.

Spread for Bread

Army Spread, now included in packaged rations, is unsuitable for use at temperatures below 20 deg. F. Margarine may be useful at lower temperatures, though not for temperatures above 90 deg. F. For specification purposes, information is needed on the relationship of palatibility and storage life to such factors as type and degree of hydrogenation of oil, presence of antioxidants, degree of acidity of the skim milk, type and concentration of emulsifying agent, and concentration of salt.

The need for a spread for bread having physical properties enabling it to retain spreadability over a wide range of temperatures necessitates modification of butter. Initial attempts to modify butter for tropical use resulted in the development of Carter's Spread. Experience soon indicated that this product was undesirable because of its waxy characteristic. Developmental work resulted in Army Spread, a product that filled the requirements and was high in acceptability.

But during storage at uncontrolled temperatures, Army Spread has a tendency to spoil. Its susceptibility to bacterial contamination, one of its chief deficiencies, necessitates the development of analytical and sanitary control procedures.

Bacteriological spoilage of this spread can be held to a minimum only if adequate control of quality of raw materials is maintained, particularly of the butter and cheese curd. Close attention to formula details, especially concentrations of salt and sodium benzoate, must also be maintained. Sought is information necessary to revise the present specification to provide the required control.

This project involves definite industry cooperation to bring about its solution. It is hoped that through informal contracts with interested institutions and the Quartermaster Food & Container Institute, research activities can be carried on which will bring an answer to the problem.

The problem of preventing oxidative rancidity by using antioxidants has

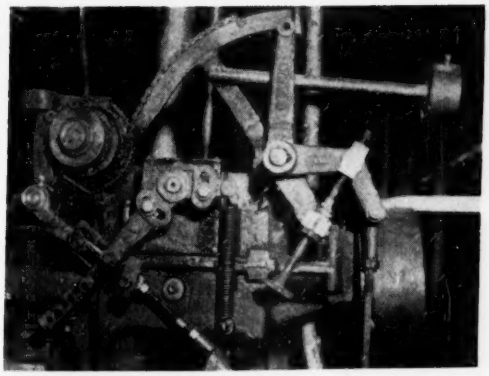
(*Turn to page* 164)

Chance to Contribute

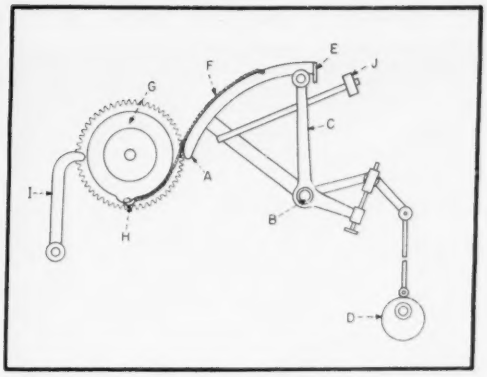
Obstacles to be overcome in developing ration components derived from dairy, oil and fat products are outlined in this sixth of a series on key problems in foods for the Armed Forces.

It is hoped that readers who are versed in the technology of milk and milk products will see in this outline opportunities to contribute toward solutions of the various problems.

Industry, through the Associates, Food & Container Institute, through its own associations for advancing milk technology, and through individual counsel and aid, have already contributed impressively. The QM goals, however, are not simple nor easy to attain, as those who study these problems will concede.



ROTATION of auger disk is increased. Link-chain drive stops disk at same point—extending precision range.



COMPONENT PARTS of mechanism are here lettered A to J. Letters referred to in text describe how unit works.

New Drive Doubles Auger-Filler's Range

Tangential chain replaces the sliding drive rod—thus extends accuracy range from 4 to 8 oz. containers of cake frosting

IVAN C. MILLER
Editorial Consultant, "Food Industries"

Changes made to the driving mechanism of an auger filler have doubled its accuracy range.

The machine, used by Taylor Reed Co., Glenbrook, Conn., for filling paper packages with cake frosting, formerly was accurate only between 2 and 4 oz. Problem was to extend the range to fill accurately up to 8 oz., or purchase an additional machine.

Volume of fill is controlled by the revolutions of the auger. These are driven through engagement of a clutch mechanism. Termination of each fill is controlled by a clutch-operated cam, time of filling by a slipping disk in the clutch on which the cam is located.

A tension rod attached to the slipping disk regulated its "set" and travel. The amount of fill was therefore limited by the travel of this rod. When the rod moved the slipping disk through a small arc, for a light fill, the volume was accurate. When formerly, the machine was set to deliver a greater volume the rod moved the disk through a longer arc, until at the machine's limit the rod was pulling perpendicular to the disk. Accuracy was lost when the machine was operated near maximum delivery—because the disk did not always stop at the same point.

To increase the unit's accurate capacity, the rod was removed and replaced by link chain traveling on the curvature of a sector (see photo and sketch above). The sector (A) is a semi-circle of scrap iron, pivoted on shaft (B). Arm (C)—the same arm to which the old tension arm was attached—is operated by cam (D). As (C) moves clockwise, it bears on a flange of metal (E) welded onto the sector. The chain (F) pulled by the sector rotates the sliding clutch disk (G) counterclockwise. Cam (D) releases arm (C), which returns counterclockwise, permitting the clutch plate (G) to engage and rotate the auger. The clutch cam (H) disengages the clutch through arm (I).

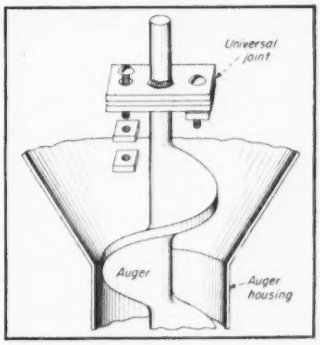
The counter-weight (J) was added to prevent the sector from falling as arm (C) returns. It also provides sufficient tension in chain (F) to prevent slack, but not enough to retard the clutch disk.

Since the chain wraps around the disk, the length of arc the disk can now be rotated has been increased. Because the pull is now tangential (instead of straight out), the disk always stops in the same place. The machine now fills with the same accuracy throughout a range of fill from ½ to 8 oz.

Auger Improved

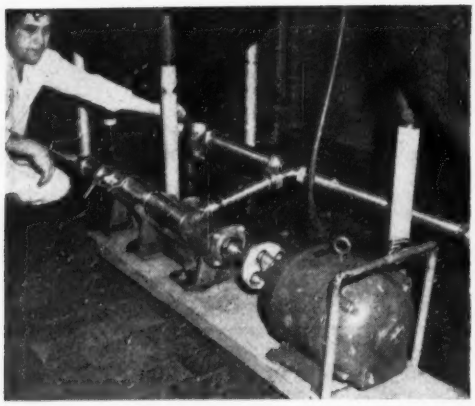
Difficulty in filling was experienced during the peak of the summer, when the heat caused the frosting to become sticky. This trouble was traced to the auger, rather than the operating mechanism. To remedy it, an experimental change was made—and it proved satisfactory. Here is how the change was made:

A section of the auger stem rising above the flight was cut away and a universal joint inserted. This joint was made of two small steel plates, one of which was welded to the shaft of the auger. Matching holes were then drilled in the plates, large enough to allow considerable play between the holes and the bolts which attach the plates. A clearance of ⅛ in. was also allowed between the plates, with two nuts, locked on each bolt, keeping this clearance constant. This arrangement (lower sketch) permits the auger to wander in its housing (termed "Wobbling Auger"). It fills with normal accuracy when the frosting is sticky.

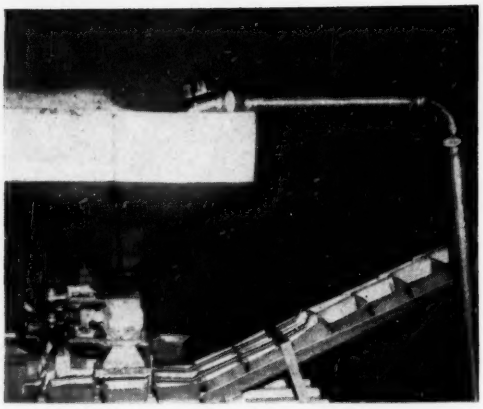


INSERTION of universal joint (two plates) permits auger to "wander."

New method of emptying kettles in 10 minutes . . .

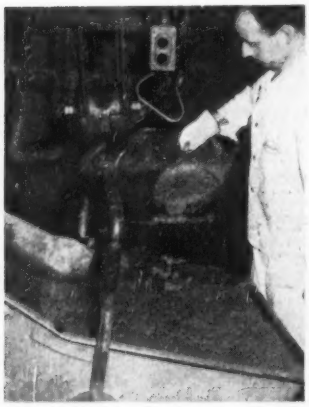


NOW, pump is rolled to kettle, pipes are attached, valve is opened, and flow of hot scrapple is started.



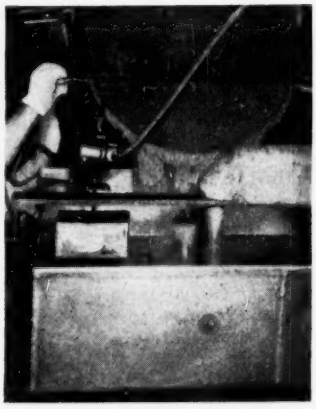
PIPE feeds scrapple directly into hopper of panning unit. Pans are filled two at a time, each with 2 lb. of product.

. . . replaces old system that required 30 minutes



FORMERLY, scrapple was scooped from kettle into bailing bucket.

NEXT, bucket was raised by electric hoist and pushed along monorail.



THEN, product was emptied into hopper of automatic panning unit.

Doubles Volume With Hoist and Pump Rig

Philadelphia packer's new meat-handling system slashes grinding and unloading time, cuts product losses, and saves man-hours

JOHN V. ZIEMBA
Assistant Editor, "Food Industries"

A notable rise in operating efficiency, saving one-third on time and doubling output, has been achieved in the scrapple department of John J. Felin & Co., Philadelphia. The improvement came through installation of two quicker, more direct handling methods—(1) for feeding pork into a grinder and (2) for emptying scrapple from cooking kettles to fill the hopper of the automatic panning machine.

Speed-up at the grinder has been attained with an electric hoist. Mounted on an overhead track and simply operated by a push-button control, it lifts a 200-lb. container load for feeding directly into the grinder. Thus, time for the task—formerly a shoveling job—has been cut one-third, making it possible to get the ground meat to the precook kettles that much faster.

Advantages of Pumping Scrapple

The new way of emptying scrapple from the kettles is remarkably simple, yet works like a charm. Specifically, it entails use of a sanitary, stainless

steel, mobile pump, with sanitary valves attached to each kettle and "quick-on" and "quick-apart" stainless steel pipes for delivering the scrapple from the cookers to the panning machine.

And so effective has been this new installation that kettle emptying also takes only one-third the time. The former tedious, time-taking method of scooping scrapple from kettle to bailing bucket and carrying it to the panning machine required about 30 min. But now, by using the pump, a 950-lb. batch is emptied in only 8 to 10 min.

Here is how the new system has enabled this scrapple manufacturer to more than double his output: Time formerly lost in emptying the kettles is now devoted to filling them and cooking the scrapple.

Better Sanitation

Another advantage of the new scrapple-handling system is better sanitation. Kettles have been fitted with sanitary valves and 3-in. dia. stainless steel pipes. The latter are attached to the pump when the kettle is to be emptied. Removable stainless steel pipes are hooked up to the pump and panning machine. And the old T-shaped pipes from kettles to pump are now being replaced with spiral-wound flexible stainless steel tubing.

Still another advantage effected by the pumping is the reduction in shrinkage. With the former system, a considerable amount of scrapple was lost in scooping from the kettle to fill the bailing bucket. Product would splash on the floor, thus creating insanitary as well as unsafe conditions. A 0.5 percent savings is reported with the new closed system of handling.

And yet another advantage is the savings in help. Only one man is needed to fill and empty the kettles. Formerly, it took two men—one to fill the kettles and the other to empty them. Man-hours thus saved have now been applied on other work.

Employees also like the new system, since the work is easier. With the elimination of the former bailing-bucket method of transporting scrapple from kettles to panning machine, there is no longer the multi-step job of: (1) Lowering the bucket to kettle-height with an electric hoist, (2) filling the bucket with more than 300 lb. of scrapple with the aid of a 10-lb. capacity, stainless steel scoop (very unpleasant over the hot cooking kettles), (3) raising the bucket with the hoist, (4) pushing it along a monorail to the panning machine, (5) dumping the product into the hopper of the unit, and (6) pushing the empty bucket back to the next kettle.

Even that wasn't the full story—for this six-step operation had to be repeated twice again before a kettle was emptied.

How New System Works

Now for the point-by-point details of making Philadelphia scrapple the new way:

Pork meats from the cutting department are delivered to the scrapple-cook room in 1,000-lb. capacity metal box trucks. First, the meat is ground and precooked. From the metal box trucks, the meat is transferred into a metal container mounted on a metal frame with casters. Next, an electric hoist raises the container out of the frame, and the meat is emptied into the hopper feeding the grinding machine. Then, the meat passes through ⅛-in. perforated plates and drops into a 200-lb. capacity metal container. Again the hoist lifts the container—this time to feed one of the three 900-lb. capacity steam-jacketed precook kettles.

Now the meat is precooked 1½ hr. at 180 deg. F. In this operation, the meat is scooped from a kettle into a bailing bucket and transported to the cooking kettles with the aid of an electric hoist and overhead monorail.

Then, a 535-lb. batch of corn meal, rye flour, spices, and water is prepared. Ingredients are weighed and dumped into a metal tank equipped with a dual-propeller mixer. After the ingredients are mixed 3 min., a hoist lifts the tank from its supporting metal frame. The tank is then pushed on a monorail directly over one of the cooking kettles. Contents are poured into the kettle by opening a valve at the bottom of the mixing tank.

Next step is cooking the scrapple. The ground, precooked meat and the corn meal-flour-spice mixture is cooked 1½ hr. at 204 to 206 deg. F. While the scrapple is being cooked, it is also mixed with slowly turning double-blade paddles.

Panning Unit Filled

Filling the panning machine by the new method follows. In order to adopt the new scrapple-pumping method, the cooking kettles had to be raised 18 in. off the floor. Outlets with sanitary valves had to be provided at the bottom of the cookers. These outlets are paired to facilitate emptying of the kettles. With this arrangement, it is only necessary to move the mobile pump four times, instead of seven.

And another thing. By pairing the outlets, only four, instead of seven, pipes are needed to carry the scrapple to the panning machine.

Lengths of the four pipes: From the first pair of kettles, 4 ft.; from the second pair, 12 ft.; from the third pair, 12 ft.; and from the seventh kettle, 6 ft. The pipes rest on metal racks in front of the kettles and 12 in. above the floor.

Emptying Kettles the New Way

Here's how the cooking kettles are now emptied: The pump is rolled between the first pair of kettles, and a short flexible, stainless steel tubing is attached to the first kettle and the pump. Then a 4-ft. pipe is connected to the pump and to the hook-shaped pipe that feeds the hopper of the panning machine. The valve at the bottom of the kettle is opened, the pump is started, and the scrapple is carried to the panning unit. Meanwhile, the operator fills another tank.

After the first kettle is emptied, the flexible tube is disconnected and then attached to the second kettle. The valve is opened and pumping is resumed. And at this time, the operator cleans and fills the first kettle.

Now, with the second kettle empty, the operator again disconnects the flexible tube from the outlet and the rigid one from the pump. He then rolls the pump between the second pair of kettles. The flexible tube is connected to the third kettle, and another rigid pipe—this time a 12-ft. one—is attached to the pump and the 4-ft. pipe from the first pair of kettles.

The second pair of kettles is now emptied in the same manner as the first pair. Then the pump is rolled between the third pair of kettles, where another 12-ft. pipe is attached to the pump and the two rigid pipes from the first and second pair of kettles.

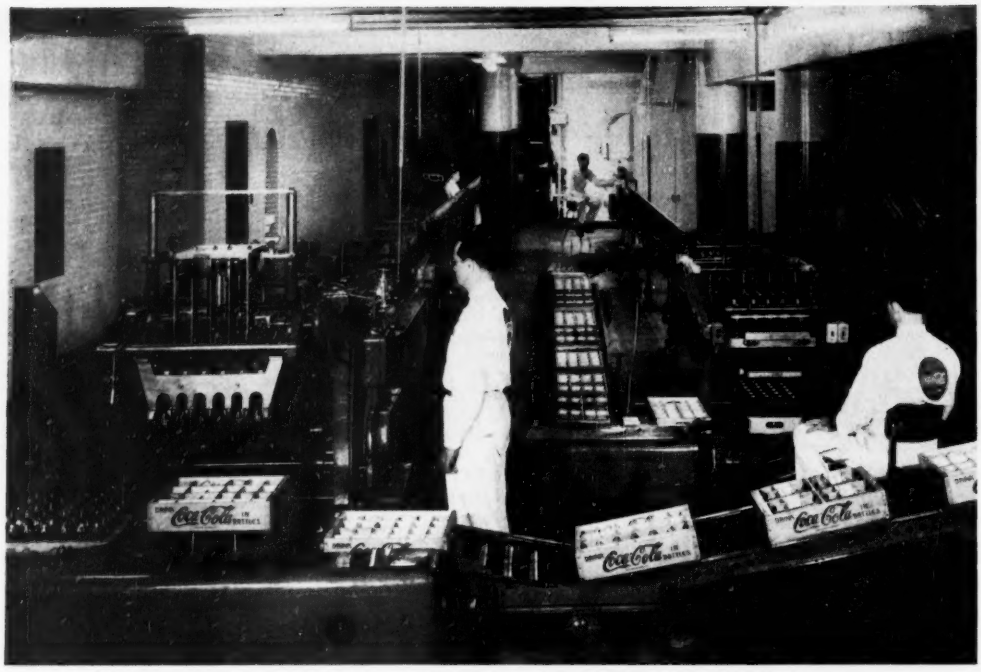
Final steps are rolling the pump to the seventh kettle and attaching a 6-ft. pipe to the pump and the pipes from the three pairs of kettles.

To enable the operator to identify the position of the four rigid pipes on the line, each pipe has a metal code-number tag.

Panning is the last step. The hopper of the panning machine holds 250 lb. of scrapple. It is equipped with a float that automatically shuts off the flow of product when the hopper is full.

Empty stainless-steel pans are fed to the machine. Here a conveyor carries them, two at a time, directly under the volumetric filling unit. The conveyor stops momentarily while the two pans are filled, each with 2 lb. of scrapple.

Pans then continue on a slatted, stainless-steel conveyor to the station where they are check-weighed and loaded onto racks—each holding 324 pans of scrapple. Racks are finally rolled into a cooler and held overnight at 36 to 40 deg. F. This serves to solidify the scrapple, and it is now removed from the pans and wrapped in cellophane.



TAKE CASING for instance: Automatically unloaded (left), cases move to cleaner (upper right) where they are inverted and shaken, then go to packer which assembles 24 filled bottles and drops them into each case. Filled cases are conveyed to first floor loading docks.

They Channel Labor Saving Into Quality

Bottling plant's latest equipment—new casing units, special loading docks, unique conveyor system—frees man-hours. And they're "translated" into better product

A. V. GEMMILL
Assistant Editor, "Food Industries"

Advanced food plant engineering has put high efficiency, close quality control, and effective sanitation into bottling operations in the new plant addition of the Coca-Cola Bottling Co., Indianapolis.

Costs are reduced by fully automatic case unloaders and packers, conveyorized handling of syrup drums, and efficient case and bottle handling systems.

Quality control is improved by electronic inspection of filled bottles, together with treatment of water to condition it for use both as an ingredient in the beverage and for bottle washing.

Sanitation is advanced by inverting cases of empty bottles to remove foreign materials, by using drip pans under conveyors, and by "air conditioning" lockers. The street-floor filling room is laid out as a show place, and the entire plant is designed for easy cleaning.

Careful Planning Does It

The new plant addition—over 183,000 sq. ft.—is of 2-story and basement construction. It gives the plant a total floor space of 340,000 sq. ft. Plant functions are divided in such a way as to make the best use of this added space.

On the second floor are located the syrup room, crown room (with supply hoppers above each of the five first-floor bottling lines), and syrup and empty case storage. The first floor is devoted entirely to filling, crowning, inspection, and truck loading, and the basement houses case handling, bottle washing, and plant utilities.

The loading area has 26 docks. These permit direct-from-conveyor loading, thus eliminating the need for pallets, flats, or a special storage area.

All walls, except those of the filling room, are of light green ceramic brick. Ceilings of the first and second floors are of acoustical tile, and the floors are of terrazzo. Fluorescent lighting is used throughout.

The first floor filling room was designed especially to impress the visiting public with the plant's cleanliness and sanitation. Walls are of Tennessee marble and the floor is of a special checkered block terrazzo. All lighting is recessed in the ceiling.

As an example of the careful planning that preceded erection of this new plant, columns were eliminated from the bottling room. Floors of the syrup room and adjoining storage areas are supported from the roof. By eliminating the columns, appearance

and sanitation were improved. Of equal importance, however, was the saving in space—a saving that will permit installation of two additional bottling lines when needed.

How Materials Are Handled

In planning the new addition, handling methods were thoroughly examined in a search for ways of saving labor and cutting costs. This resulted in installation of the newest automatic equipment and unique conveyor systems. Here is one example: Flavoring syrup is received, as at all Coca-Cola bottlers, in 50-gal. stainless steel drums ready to be used in the drink. In most plants, the syrup is pumped from the drums into flavor tanks that feed the fillers.

In this plant, however, a different system is employed. Drums are brought to the plant on stake trucks which are raised to the second floor on an elevator. Here, the drums are rolled onto specially designed dollies that run on elevated tracks leading into the syrup room. For storage, sidings are provided from which the drums may be run into the syrup room as they are needed.

In the syrup room, tracks follow the two longest walls, and on each track 15 drums are assembled and connected to stainless steel headers by plastic tubes. Syrup from the drums flows through a filter and into a small balance tank that supplies the syrupers on the bottling lines below. By alternating the gangs of direct connected drums, a constant feed of syrup is maintained without pumps or storage tanks. Also, cleanup time is shortened, and chances for contamination are reduced.

Moreover, cost of handling cases and bottles was reduced with the installation of an unusual conveyor system, plus the setting up of 26 loading docks

Special Docks Reduce Case Handling

TRUCK LOADING is facilitated by 26 new conveyor-served docks. These permit approximately 80 percent direct loading from conveyors.

and installation of newly developed automatic case unloaders and loaders. An additional labor-saving factor, as regards materials handling, is the maintenance of approximately 50 percent more delivery trucks than are needed for the routes.

Cases of returned bottles are conveyed directly from unloading docks to the plant's basement. Here, the cases are emptied by automatic unloaders which lift out the entire 24 bottles at one time and feed them to soaker-washers that discharge clean bottles onto a conveyor in the first floor filling room.

Empty cases move on to specially designed case cleaners which invert and shake them. Then they go to the automatic packers. These units assemble 24 filled bottles, then position and raise the case, drop in the bottles, and lower the filled case back onto the conveyor.

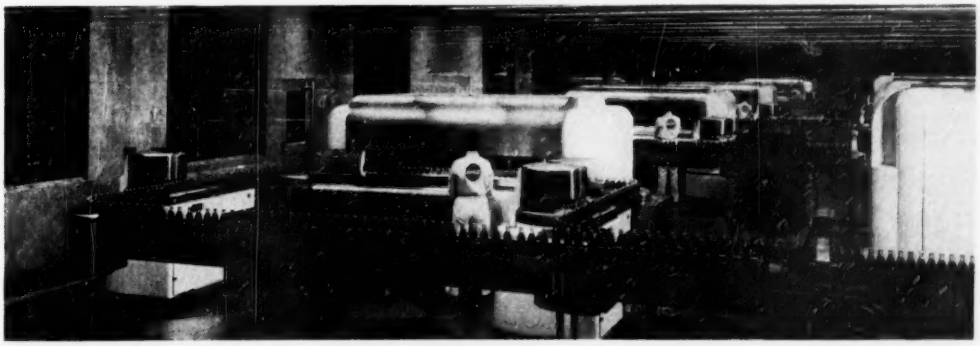
Filled cases are conveyed to the first floor loading area, where gravity sections branch off onto each dock. Trucks standing at these docks are loaded directly from the conveyors. The remainder of the day's production is stacked on the docks for easy loading onto other trucks.

Advantages Cited

This system has a number of advantages: Trucks can be loaded from both sides of the docks; a majority of the cases are handled only once; a minimum of labor is required for the loading; no pallets or flats are used, and filled-case storage areas are not needed.

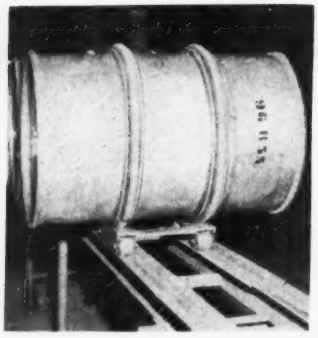
A further saving in materials handling cost is effected by the use of low-

"Eye" Beams Inspect Filled Bottles



BOTTLES from filler go (240 per min.) through divider, then past two electronic inspection units and into transfer unit which lowers them to basement. Here, bottles are deposited onto conveyors that feed case packers.

Dollies speed drums to . . .



. . . syrup room . . .

. . . then tubes feed fillers

pressure, liquid CO_2. This is delivered in tank trucks at pressures of 250 to 300 psi. and transferred to the plant's basement storage tanks. These tanks are equipped with refrigerating units and heating coils. For use in the filling operations, the CO_2 is piped from these storage tanks to the carbonators in the bottling room.

Accent on Quality Control

In addition to precautions normally taken to guard a product's quality, a number of "extra" operations are performed in this plant. When the cases of empty bottles are conveyed to the basement, they are automatically inverted (in groups of five cases) to permit any liquid or straws to fall from the bottles. And, as the bottles travel from the automatic unloaders to the washers, they are twice inspected to cull out those which need special washing and those with chipped necks.

Crowns are "vacuum cleaned" before they are placed on filled bottles. This is done with a hotel-type vacuum cleaner system installed in the basement and connected with each crowner. Each crown, before going on a bottle, passes the vacuum cleaner orifice, and any dust that has been generated in the crown hopper is removed.

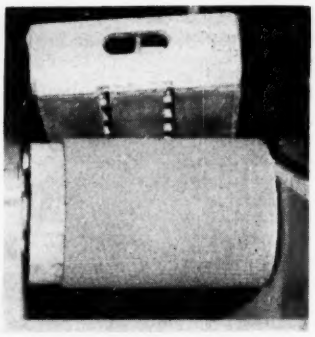
Washed bottles are visibly inspected as they are discharged from the soakers onto the conveyors that feed the fillers. Filled bottles are inspected electronically by RCA units that reject all bottles containing moveable particles. And finally, the filled bottles are rinsed under a spray hood just before they enter the case packers.

Two Water Systems

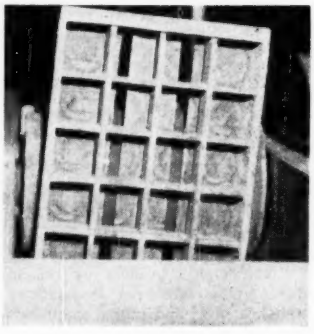
Two water treating systems are employed. For bottling, well water (highly alkaline) is neutralized, chlorinated, and sand and carbon filtered. For the bottle washers, city water is softened with fully automatic sodium zeolite units having a capacity of 1,000,000 gal. per day.

Sanitation rated high in this plant's

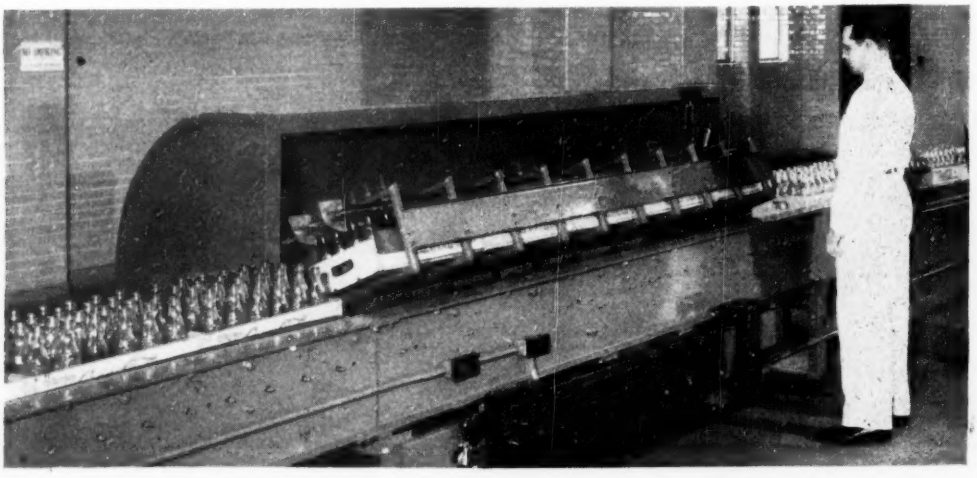
Up and . . .



. . . over goes case . . .



. . . and litter's out



Another innovation is case inverter that automatically empties bottles

design. For example, all cases of returned bottles go directly to the basement, and neither cases nor unwashed bottles ever reach the filling room. By use of 2-story washers, returned bottles enter at the basement level and washed bottles are discharged in the filling room.

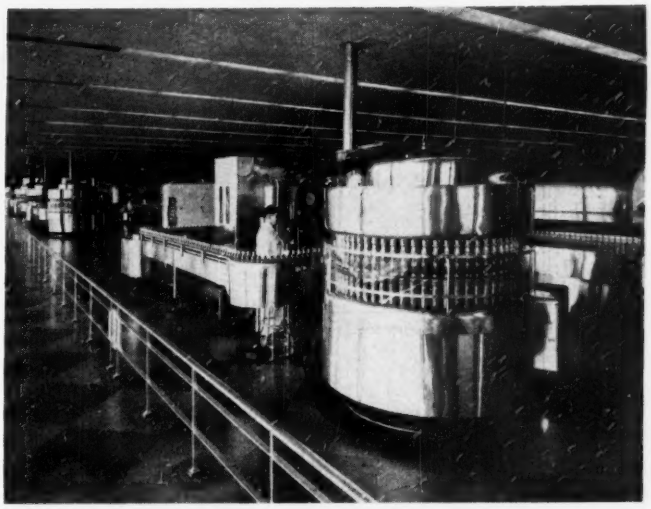
Filled bottles are lowered to the basement for casing by means of special transfer units that receive the bottles from conveyors leading from the fillers and discharge them onto other conveyors that feed the automatic casers.

All bottle conveyors in the filling room are equipped with stainless steel drip pans to prevent spillage onto the floor, and application of soap to the bottle conveyors is held to a minimum to eliminate foaming.

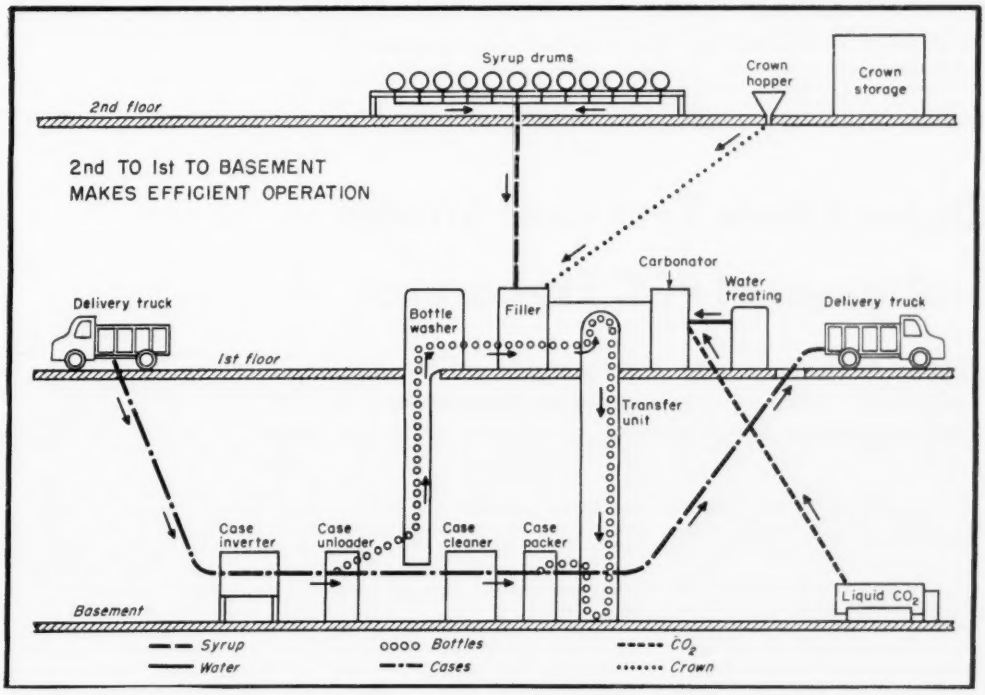
Filtered Air Throughout

The plant has circulated, filtered air throughout. Fresh air enters through towers in the plant's roof and goes to two fans located in the basement. Here, it is electrostatically filtered and distributed to the various areas by a system of ducts. Air is exhausted from the bottling room, syrup room, offices and laboratories by blowers.

In the locker room there is a unique departure from the usual air circulating system. Air from one section of the building is exhausted into the locker room. Here, the lockers have been placed over the exhaust ducts so that the air is drawn through them just before it leaves the building. Result: None of the usual "locker room odor."

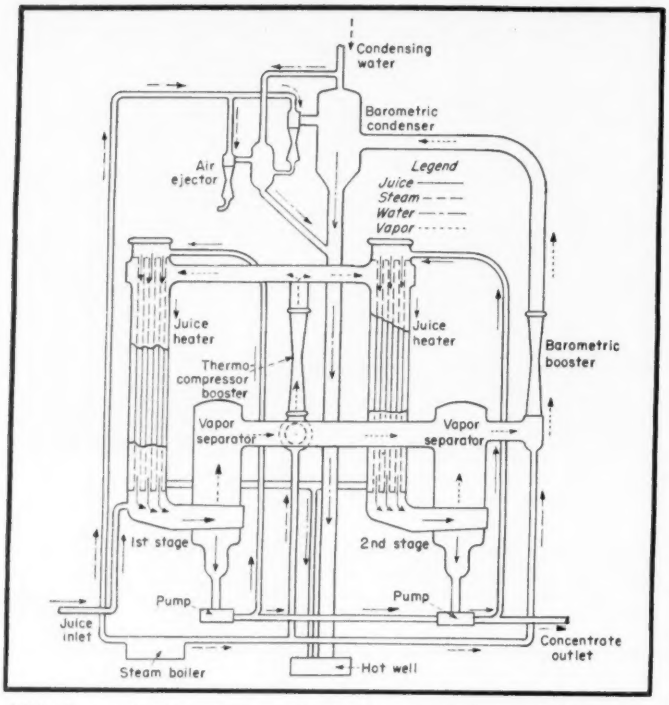


BOTTLING ROOM, 290 ft. long, contains five 60-spout fillers, has room for two more. Walls are marble, floor terrazzo, ceiling acoustical tile, lighting recessed.



FLOW CHART shows how returned cases go from truck (left) to basement, are inverted to empty residues, then are fed to uncaser. Removed bottles then go to washer, are cleansed and discharged on first floor. After filling and crowning, they are transferred to basement, cased, and conveyed to first floor loading dock.

Inside Story of Latest Juice Concentration Unit



SINGLE strength juice enters unit at left and is circulated through heater until a concentrate of 25 deg. Brix is obtained, then pumped to 2nd stage and circulated through 2nd heater until desired concentration is reached. Vapor separation is simplified by using tangential opening into separator.

Report New Technical Strides In Design of FCC Evaporator

Separation of vapor from juice by centrifugal force gets accent. Simple thermocompressor is employed. Warm vapors heat circulating juice

C. D. ATKINS, F. W. WENZEL and E. L. MOORE

First and third named authors are research fellows, Florida Citrus Commission, Florida Citrus Experiment Station, Lake Alfred, Fla. Second author is supervisory chemist.

A new type evaporator designed to operate at high vacuum and low temperature has recently been developed by the Florida Citrus Commission research department in cooperation with the Florida Citrus Experiment Station, Lake Alfred.

This new unit is now seen gaining acceptance in the manufacture of frozen concentrated citrus and other fruit juices.

Of special interest is design of the vapor separation chambers. Juice from the heaters enters through tangential openings and flows down the sides of separators in a thin film. Vapor, propelled by the centrifugal force, releases any droplets of juice as it rises into the vapor headers. Reported for this evaporator are: Low first cost, ability to use existing facilities, and high operating efficiency.

Design was based on work carried out by Florida Citrus Commission personnel at U. S. Citrus Products Station, Winter Haven, from 1942 to 1947. Small evaporators, some of them constructed from Pyrex glass, were helpful in finding ways of overcoming disadvantages. It was learned that our evaporator could be maintained at higher vacuum by cooling the water used in the condensers, or by removing the vapors by steam jet boosters. Where motive steam was used, it was necessary to re-use the warm vapor to heat the circulating juice in order to effect economy.

Temperatures employed to evaporate the juice were determined by conducting concentration experiments at various pan and heater temperatures. These tests indicated, that where recirculation was employed, flavor of the juice was not materially altered when vapor was removed at 80 deg. F. or below, and if heater temperature did not exceed 110 deg. F.

Unit Constructed

Using information secured from these experiments, there was constructed, during the 1948-49 season, a single-stage thermocompressor unit having a capacity of 192 lb./hr. vapor removed at pan temperatures of 60 to 90 deg. F., and heater temperatures of 90 to 120 deg. F. Problems arose as data were collected on this unit. Vapor ducts were found to restrict flow of vapor being removed. And difficulty was encountered in maintaining a proper head of liquid on the suction side of the circulating pump. The $\frac{3}{4}$-in. heater tubes contained sufficient surface but restricted flow of vapor thus increasing the temperature.

Certain factors were also found to effect efficiency of the jet booster or thermocompressor removing vapor from the pan and passing it into the tube nests as a source of heat.

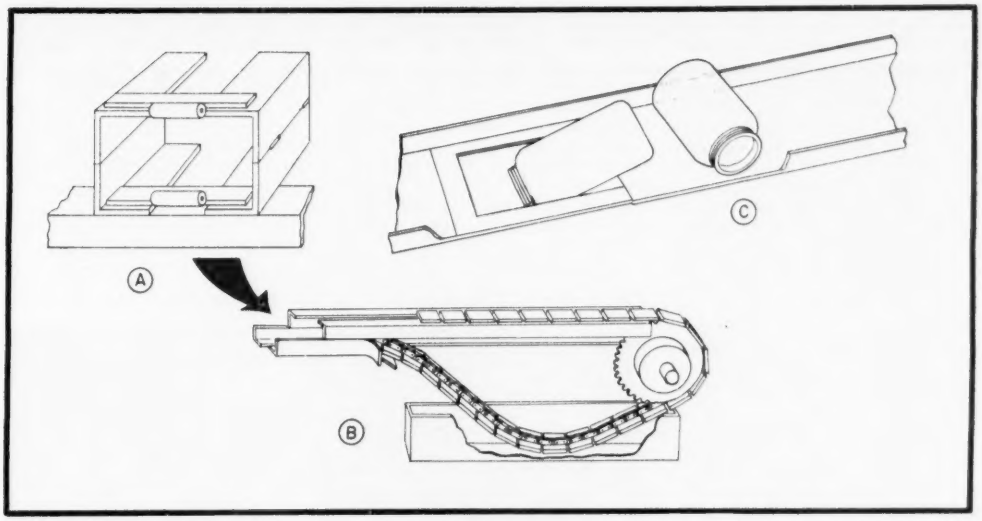
These and other observations were considered in building an entirely new evaporator for use during the 1949-50 season.

Factors influencing design of this new unit and its capacity were: An existing supply of steam at 100 psi., an 18-in. barometric condenser using 120 gpm. of water, and a 2-stage air ejector system previously installed. Well water was available at 80 deg. F. Juice handling, canning and freezing facilities indicated the desirability of building a unit having a capacity of 28 gph. of 4-fold concentrate.

Calculations indicated that the removal of 700 lb./hr. of vapor (the

(*Turn to page* 169)

Three Hints for Better Conveyor Performance



HERE are the details on three improvements. (A): Four angle irons welded at intervals form a sturdy, rigid guide. (B): Lubrication is provided by passing slackened portion of belt through a trough of soapy water. (C): Sliding jars are automatically discharged by a simple device consisting of a metal plate with a rectangular slot.

How to Improve Your Flat-Top Conveyors

Usefulness of these movers depends largely on how you erect them, type of guides, amount of belt slack, and lubrication and cleaning

W. A. REED
Plant Engineer,
Taylor Reed Co., Glenbrook, Conn.

It's ten to one that your metal flat-top chain conveyors can be made to do a much better, more dependable job. All it takes is a little applied ingenuity, plus conventional tools and materials.

True, these small carriers seem overshadowed by the larger machines they serve. But by augmenting the performance of these movers, benefits are derived all along the line. Remember, "a chain is only as strong as its weakest link."

These chains may be classified into curved and straight-line conveyors. Those which travel around a curve are usually designed for a specific function and are built-in as a part of a machine. The straight-line carriers—the ones most adaptable to a variety of uses in the food plant—are of two types.

In one, the plates are attached to a link or roller chain that is driven through sprockets. In the other type, each plate is hinged to the next, the plates forming a continuous belt. For general use, these two are equally advantageous, though there are a few minor applications for which each type is best adapted. Their performance depends largely on how they are erected and engineered, lubricated, and cleaned. Also the type of guides, sprockets, drives and the amount of belt slack.

Frames Are Easy to Make

The conveyor guide or housing is very important to efficient and economical operation. An effective frame can be readily and easily constructed in any food plant welding shop. Made of two pairs of angle irons, 1 x 1 in. or 1½ x 1½ in., it may be formed in any of several arrangements, so that the upper and lower levels of the flat-top conveyor ride on the flat surface of the angle iron.

Of the six possible angle iron arrangements only one is recommended for general use. In this combination, all vertical surfaces of the angle iron are on the outside, the four angle irons forming a rectangle.

The transporting conveyor slides on the top of the upper angle iron, with chain or hinges down. On the return level beneath, the chain travels on top of the horizontal surface of the lower angle irons, drive side up. The chain or hinges of the upper belt travel between the edges of the angle irons which serve as guides. The vertical legs form the guide for the belt on the lower level—as at (A) in drawings above.

The conveyor frame is made rigid by welding the vertical legs together at intervals of every few feet. When the channels are properly spaced, metal strap or angle iron is welded, as needed, across the underneath side of the lower conveyor guides. Causing no interference with the conveyor travel, these provide members to which the supporting legs of the assembly are attached.

Details at Sprockets

The top angle irons extend close to the sprockets with a little clearance. Top surfaces are cut with a hacksaw a distance of 3 or 4 in. from the end. The cuts are made close to the vertical

legs so as much of the surfaces as possible can be curved to meet the sprocket tangentially. At the end where the belt leaves the idler to return to the guide surface, the metal must be curved down sufficiently so that the belt rides onto the angle iron without interference. The sprockets should be so placed that there is a slight drop (about ⅛ in. from the level of the conveyor to the level at the top of the sprocket). This provision prevents the belt from jerking or vibrating, which would topple jars.

The lower angle iron should not extend closer than 2 or 3 ft. from the sprocket. This gap between lower frames and sprocket is left to provide space for belt slack—as at (B) in group of sketches. No belt tightening adjustment is necessary when there is ample slack in the belt following the drive sprocket.

Though the belt slides on the surface of the angle iron throughout its travel, no more horsepower is required than for any other arrangement. For the average length conveyor a ¼-hp. motor is sufficient. The conveyor should be lubricated at all times. Oil or grease should be used only at the shaft bearings. Soapy water lubricates, cleans, and quiets the operation of the belt, even clanking being lessened. Lubrication of the belt is accomplished by installing a trough so located that the belt slack runs through the soapy water. Another way is to cut away a portion of the lower angle iron guides and force the belt to follow a replacement guide curved down against the upper belt surface. This guide causes the belt to dip into a trough of soapy solution.

When a flat top feeds a labeling machine in which jars roll on their sides, a twist is necessary to change the jars from vertical to horizontal. Occasionally jars will go askew, and slide into the labeler lengthwise instead of rolling crosswise.

Simple Device Ejects Sliders

Any jar not properly aligned can be ejected automatically by a very simple device—shown at (C) in sketches. A metal plate with a rectangular slot is placed at the end of the twist. The slot is longer than jar height and just slightly wider than the diameter. Sliding lengthwise, the jar will fall through the slot. A properly aligned jar will be engaged by the shoulders of the guide and roll past the opening.

■ **The few cents this gadget cost has saved hundred of dollars in lost production time.**

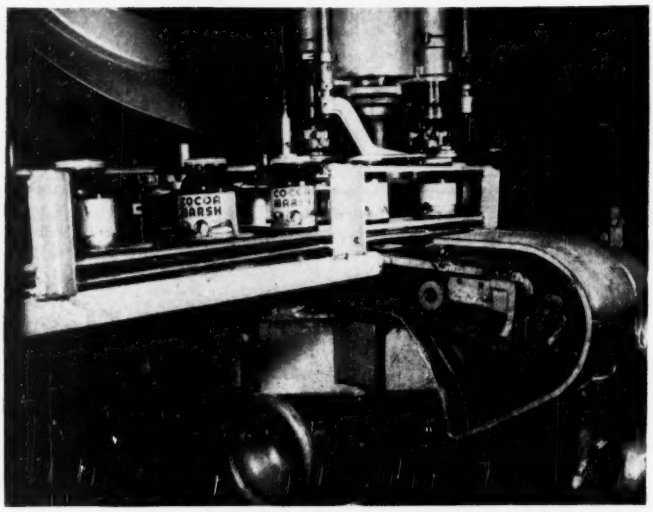
Sometimes it is necessary for one flat-top conveyor to cross another. We encountered such a situation in our plant. There was no place or room at the side of the jar capping machine to attach the idler sprocket of the feeding conveyor. The idler had to be located beyond the capper and across the path of the delivery conveyor. Because of a traffic aisle, the delivery conveyor could not be routed around the idler end of the feed conveyor.

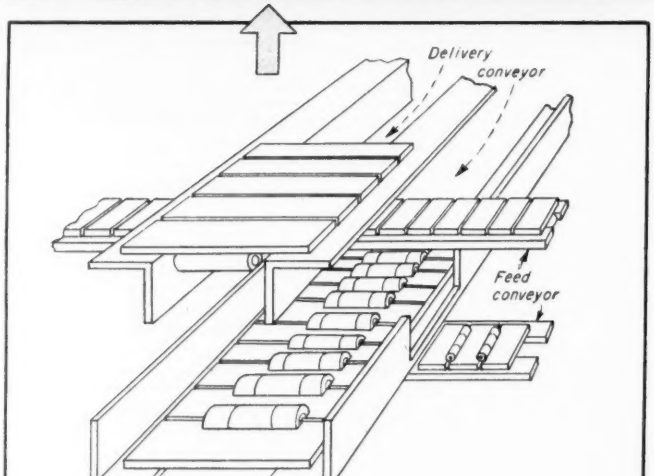
The crossing we installed has been very satisfactory. Here are the details:

Just beyond the point where the jars are transferred to the capping machine and 1 ft. before the crossing, the conveyor guides were bent down at a sufficient angle to allow this feed line to pass under the delivery conveyor (see sketch, lower right). The vertical sides of the angle irons on which the delivery conveyor travels were cut away at the intersection to permit the feed conveyor to pass between the two levels of the delivery conveyor with minimum clearance.

A different arrangement of angle irons guides was used on the delivery conveyor because of the crossing. The vertical legs of the top conveyor angle irons were located inside instead of outside. This permits the two levels to be brought closer together than when the rectangular arrangement is used.

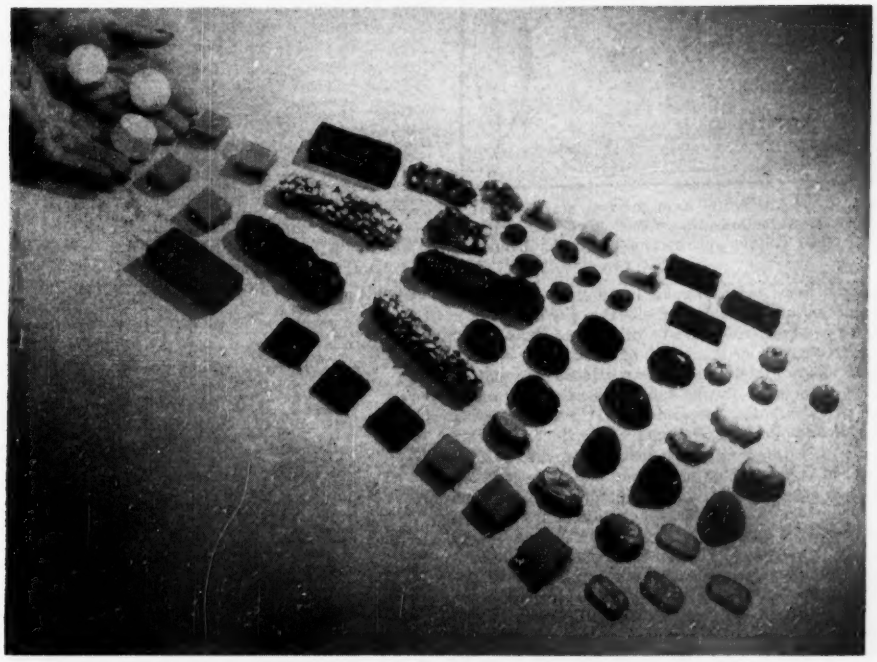
Close-Up and Sketch of Conveyor Crossing





THIS arrangement of angle iron guides is used when the space between conveyor levels is limited and must be kept at a minimum.

A SPECIAL FOOD INDUSTRIES REPORT



THESE are the 18 different **confections tested. They** represent most of the varieties on the market.

COLD STORED CANDIES

Tests Reveal Optimum Conditions for 18 Varieties

Some are easier to keep than others. Those with a low moisture content or hygroscopic syrups must be kept at low humidities. Confections containing nuts or fatty materials must be refrigerated. And low storage temperatures will counteract adverse effects attributed to use of improper humidities

J. G. WOODROOF, HELEN H. THOMPSON, and S. R. CECIL

Georgia Experiment Station, Experiment, Ga.

Practical knowledge of proper conditions for storage is of prime importance in maintaining candy quality—a troublesome problem for manufacturers wishing to keep their confections for later sales.

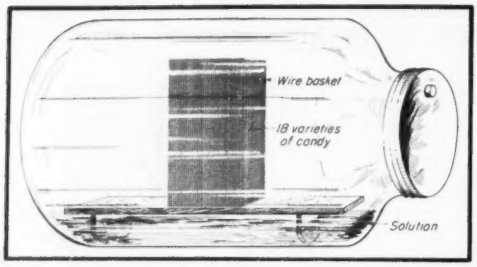
Age of the candies, as indicated by the code on the package, is of little value in determining quality, unless storage conditions are known.

The manufacture of certain kinds of candies is usually confined to specific areas. And in order to distribute such candies widely, it is necessary to transport them long distances. Furthermore, it is usually essential to warehouse such confections either before or after shipment.

Candy is a part of the regular rations for the armed forces. And since military storage conditions are not always favorable, it is necessary to know the best and worst conditions for keeping candy in these rations.

With more knowledge of refrigerated storage requirements and with better facilities to provide proper ware-

Candy-Test Jar and Suitable Storage Conditions



DETAILS of type of bottle used for test storage. Wire basket holding confections was placed inside jar on platform. Chemical solution on bottom controlled humidity.

housing conditions, a considerable amount of candies can now be successfully held in coolers. Practice has shown that at 0 deg. F. a wide variety of fine candies can be held for over a year without loss of quality.

With recognition of the need for pertinent information on proper methods of storing candies, a research project was instituted with the cooperation of the Refrigeration Research Foundation and National Confectioners' Assn.* This is the first progress report on these researches.

Purpose of this investigation was to find: (1) Optimum temperature and humidity conditions for long-time storage of candies, and (2) critical temperatures and humidities for short-time storage.

To study the effects of different storage conditions upon candies, 18 varieties were held for 130 days at different temperatures and humidities. Temperatures selected were 0, 32, 50, 68, and 86 deg. F. And the relative humidities were 40, 50, 65, and 80 percent.

The 18 varieties of candy—wrapped or unwrapped, depending upon how they are sold—were put in wire baskets. These baskets were then placed in a series of wide mouth, 5-gal. jars containing a saturated chemical solution (see drawing) to maintain the humidity within 1 percent of the four humidities selected. Duplicate samples of candies were held under all storage conditions.

Chemicals used for the different relative humidities at the four temperatures are listed in Table II.

Examinations were made almost daily for changes in color, appearance, finish, or aroma. Weighings, taste tests, and moisture determinations were carried out frequently. Candy was discarded when it was judged unsaleable. Under at least one storage condition each candy remained in perfect condition throughout the 130-day storage period. These candies are being held for a subsequent report.

The 18 test candies were carefully selected as representative of more than 300 kinds on the market. All were made by commercial manufacturers using formulas with widely different ingredients. The candies were stored soon after they were received—usually within two to three days.

Some candies were easier to store than others. Each variety of candy could be successfully held for six months under at least one of the storage conditions. And some were saleable during the same period under six or seven of the different storage conditions. Thus, there was wide variation in suitable storage conditions for the different candies. Peanut brittle was the most difficult to store over long periods, while semi-sweet chocolate squares were the easiest.

Moisture content influenced, to a large extent, the relative humidity at which candies could be stored. Candies with a moisture content below 1.5 percent—hard candies, milk chocolate, solid chocolate bars, chocolate-covered peanuts and peanut brittle—have to be kept at not over 40 percent relative humidity. Otherwise, they gain weight, become sticky, sugar, discolor, and develop a musty flavor and may mold.

Those with a 6-8 percent moisture content—chocolate-covered nut rolls, nougat bars, hard creams, sugar bonbons, coconut squares, chocolate-covered creams, and caramels—retained their original characteristics when stored at a 50 to 55 percent relative humidity.

Three of the candies—fudge, gum drops, and marshmallows—with a moisture content above 10 percent required a 65 percent relative humidity. The highest relative humidity at which any candy could be held for more than a few weeks, even under refrigeration, was 65 percent. When candies were stored at 0 deg. F., humidity was not a factor.

Because candies of widely different moisture contents

TABLE I—Candies set up in order of increasing moisture content, and requiring increasingly higher relative humidities for storage. For long-time storage the temperature should be lower and the humidities in a narrower range than for short-time storage.

			Suitable Storage Conditions			
			For 1 to 4 weeks		For more than 4 weeks	
Candy	Principal Ingredients	Moisture Content Percent	Temperature Deg. F.	Relative Humidity Percent	Temperature Deg. F.	Relative Humidity Percent
Semi-sweet chocolate squares	Chocolate, sugar, lecithin	.36	32,50,68	40–50	32,50	40
Milk chocolate	Plain milk chocolate	.52	32,50,68	40–50	32,50	40
Lemon drops	Sugar, corn syrup, lemon oil	.76	32,50,68	40–45	32,50	40
Chocolate covered peanuts	Peanuts, milk chocolate	.91	32,50,68	40–50	32,50	40–45
Peanut brittle	Sugar, peanuts, corn syrup	1.58	32,50,68	40–45	32,40	40
Coated nut roll	Sugar, peanuts, corn syrup, milk chocolate, milk solids, fat	5.16	32,50,68	45–50	32,40	45–50
Uncoated peanut roll	Sugar, peanuts, corn syrup, milk solids, fat	5.89	32,50,68	45–50	32,40	45–50
Nougat bar	Sugar, corn syrup, fats, chocolate, milk solids, egg white	6.14	32,50,68	50–55	32,40,50	50
Hard creams	Sugar, corn syrup	6.56	32,50,68	53–55	32,40,50	55
Sugar bonbons	Sugar, corn syrup	7.53	32,50,68	55–60	32,40,50	55
Coconut squares	Coconut, sugar	7.70	32,50,68	55–60	32,50	55–60
Peanut butter taffy kisses	Corn syrup, sugar, fat, molasses peanut butter, lecithin	8.00	32,50,68	40–45	32	40
Chocolate covered caramels	Sugar, corn syrup, invert syrup, dark chocolate, egg whites	8.09	32,50,68	50–53	32,50	50
Chocolate coated hand rolled soft creams	Sugar, invert syrup, chocolate	8.22	32,50,68	45–50	32,50	45–50
Plain caramels	Sugar corn syrup, fat	9.04	32,50,68	50–55	32,50	50–55
Fudge	Sugar, corn syrup, milk solids, fat	10.21	32,50,68	60–65	32,50	60–65
Gum drops	Sugar, corn syrup, starch	15.11	32,50,68	63–65	32,50	63–65
Marshmallows	Sugar, corn syrup, dextrose, gelatin, pectin	16.00	32,50,68	63–65	32,50	65

* Results are being published as Technical Paper No. 197, Journal Series, Georgia Experiment Station.

varied so much in their storage requirements, they could not be most successfully kept together more than a few weeks. Where candies must be stored together, however, the possibilities offered by moisture vapor proof packages are not to be overlooked. These will probably reduce the significance of relative humidity if temperature requirements are met.

Candies with a large amount of corn or invert syrup must be kept at low humidities because of the hygroscopic nature of these sweeteners. For example, peanut brittle, lemon drops, taffy kisses, and caramels have a high percentage of corn syrup or invert syrup. Therefore, they must be held at much lower relative humidity than hard creams or sugar bonbons, which contain little or none of these sweeteners.

Candies with nuts or added fats must be refrigerated. Those candies with fat-containing, non-sugar ingredients —peanuts, pecans, coconut, chocolate, or milk solids— needed refrigeration to preserve the natural flavors and aromas, and to prevent staleness, mustiness and rancidity. This was particularly true with peanut rolls, peanut butter-taffy kisses, coconut squares, and milk chocolate.

Low temperatures partially counteracted the adverse effects attributed to improper humidities. With each of the candies tested, the optimum relative humidity was much wider at 32 than at 50 deg. F. And it was wider at each of these temperatures than at either 68 or 86 deg. F. To stay within the critical range, the relative humidity might vary from 6 to 8 percent at 32 deg. F., from 3 to 6 percent at 50 deg. F., and from 2 to 4 percent at 60 or 86 deg. F. This was especially true with short-time storage.

Storage of candies below 50 deg. F. prevented infestation. While refrigeration did not kill all insects, it rendered insects inactive and prevented further infestation as long as the candies were held at this temperature, or lower. This is a practical application of refrigeration, since most non-sugar ingredients, such as nuts and chocolate, are subject to infestation during warm weather.

Noted were these other advantages of storing candies at 50 deg. F., or lower: (1) Rate of staling and rancidification was greatly reduced; (2) aromas, colors and flavors were more stable; (3) gloss or finish was more stable, since the candy was firmer; (4) less mashing and bruising in handling occurred, due to the firmness; and (5) mustiness or molding at high humidity were much less likely to occur.

The lowest temperatures were most beneficial. Of the five temperatures used, the lowest was found to be best for long-time storage for all of the candies. There appeared to be no danger from "freezing" candies. All benefits of storing candies under refrigeration were accentuated by using lower temperatures. And, in general, the lower the temperature the better, especially from the standpoint of the effects of relative humidity.

Moisture condensation on candies upon removal from storage under the conditions used was not serious. Samples of virtually all of the 18 candies were purposely removed in and out of storage several times. Temperatures used were 0, 32, and 50 deg. F. And, in each case, the candies were directly taken out of storage into outside rooms. In no case has there been specific adverse effects traced to moisture condensing on candies after they were transferred from a low to high temperature.

The experiments indicated that the deterioration of candies, upon removal from cold storage, generally ascribed to moisture condensation (sweating) may be due, to a considerable extent, to the prevalence of unduly high humidities in the storage atmosphere.

Candies held at too high a relative humidity will absorb moisture and gain weight. Resulting undesirable changes may then not show up until the candies are removed to a warmer or more humid environment.

Solutions to Maintain Needed Humidities

TABLE II—Chemicals Used to Maintain the Desired Relative Humidities in Test Jars at Four Different Temperatures

Temperature (Deg. F.)	Relative Humidity (Percent)	Chemical Used*
32	41	Calcium chloride
32	51	Potassium thiocyanate
32	65	Calcium nitrate
32	80	Sodium nitrate
50	39	Calcium chloride
50	50	Potassium thiocyanate
50	65	Ammonium nitrate
50	80	Ammonium sulphate
68	40	Zinc nitrate
68	52	Sodium dichromate
68	66	Sodium nitrite
68	81	Ammonium sulphate
86	41	Potassium carbonate
86	51	Sodium dichromate
86	67	Ammonium chloride and potassium nitrate
86	81	Ammonium sulphate

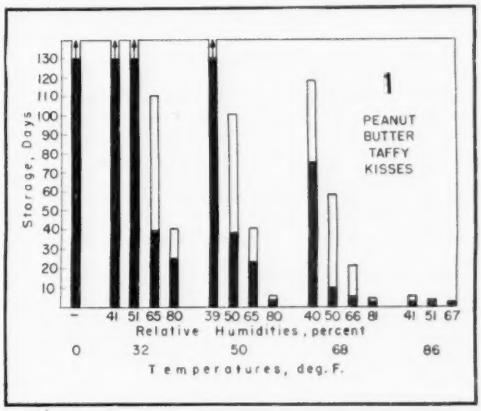
* International Critical Tables, 1926, Vol. 1, pg. 67-68. Salts are used in saturated solution with solid phase present, atmospheric moisture being absorbed by solid or released by liquid as required to maintain relative humidity.

To avoid the possibility of condensation damage, candies should be "tempered," that is, removed from cold storage to a room of not more than 15 or 20 degrees higher, taking special care that the air of the intermediate room is as dry as possible.

The problem of moisture condensation on packaged and unpackaged candies is presently being studied jointly by the Georgia Agricultural Experiment Station and Columbia University with the purpose of finding practical solutions in addition to the present practice in the industry of tempering the candies.

Now, we will give specific consideration to our 18 test candies. Results are shown in the accompanying charts. They reveal the reaction of each candy under all the storage conditions. Shaded portions of the chart columns represent number of days the candy remained in perfect condition. Unshaded portions denote when candies showed imperfections, but were still saleable. The arrows indicate conditions suitable for long-time storage of the particular candy.

1. TAFFY KISSES—This kind of candy is a modified caramel that is cut instead of cast. Moisture content of the kisses employed was 8 percent. Held at all the storage conditions, they were left in the wrappers and packed 150g. to a basket. Other samples were put in quart glass



jars that were then sealed and stored at—4, 32, 50, 68 and 86 deg. F. for five months.

Quality of the kisses changed adversely at a high tem-

perature and humidity. And shelf-life was very short under most storage conditions. A 41 percent relative humidity and a temperature of 32 deg. F. were best for long storage. For short periods, relative humidities as high as 45 percent at 68 deg. F. were satisfactory.

At humidities above 45 percent, the kisses rapidly absorbed moisture, gained weight, stuck to the paper, and finally became runny. High humidities caused the colors in the wrappers to fade, run together, and stain the candy. The lowest humidity—about 40 percent—prevented moisture gains. And rancidity was retarded at 32 deg. F.

Regardless of the humidity, 86 deg. F. was unsuitable for short-time storage. Even at the lowest humidity—41 percent—the taffy softened so that it was almost fluid. Moreover, it stuck to the wrapper and became rancid within five days. At first, rancidity was due largely to oxidation of oil in the wrapper. Later, it was noted in the candy.

At higher humidities, the kisses became unsalable even more rapidly. Moisture picked up by the kisses increased the fluidity, causing the candy to become softer, stickier, and streaked. And with greater gains in moisture, the candy became runny.

In attempts to unwrap pieces, the candy stuck to the wrapper and pulled into a soft stringy mass. The colors of the taffy were streaked and the peanut butter got dark and moist.

Taffy kisses did not soften at 68 deg. F. due to temperature alone. And at a 40 percent relative humidity, they neither lost nor gained weight. However, rancidity developed. Also, the orange color from the wrapper stained the candy. There were slight gains in weight at a 52 percent relative humidity. Greater and more rapid increases in weight occurred at higher humidities, resulting in sticky, runny, wrapper-stained candy.

Similar results were noted at 50 as at 68 deg. F. However, changes were less severe and they took place at a slower rate. Even though a 39 percent relative humidity at 50 deg. maintained moisture equilibrium, rancidity developed and the wrapper stained the candy. After 58 days, the taffy was excellent, while the peanut butter portion was stale, becoming rancid after 126 days.

Results at 32 deg. F. were the same as those observed under too high a relative humidity, except that the changes were slower and much less severe. At a 51 percent relative humidity, a slight gain in weight was enough to make the paper stick to the candy. But samples at a 41 percent relative humidity retained most of their freshness. However, there was a slight condensation and stickiness in the taffy kisses removed from 32 deg. F. to room temperature.

Effect of temperature alone: Peanut butter kisses stored at —4 deg. for four months retained most of their freshness. At 32 deg. F., a little rancidity was noted in the peanut butter, and there was a slight loss of sheen. Definite rancidity developed at 50 deg. F. And at 68 and 86 deg. F., rancid flavor and odor were much stronger. Peroxide numbers and organoleptic comparisons confirm the fact that the wrappers were much more rancid than the candy.

Unwrapped taffy kisses: For comparison, baskets of kisses with the wrappers removed were subjected to each of the storage conditions. At 86 deg. F., the candy melted and ran out of the baskets. While the kisses melted at 68 deg. F., they did not flow out of the baskets. At the latter temperature, the mass was pliant and pressed through the mesh of the basket. Pieces could not be separated into their original shape—the taffy stringing and pulling when this was attempted.

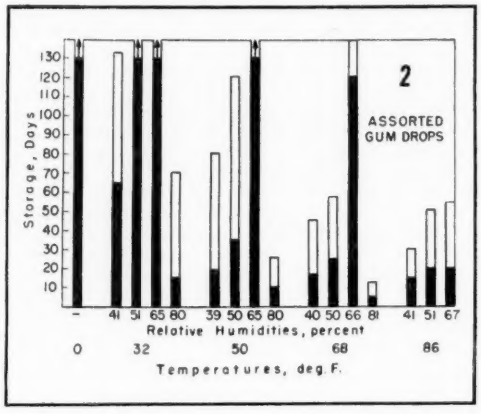
At 50 deg. F., taffy kisses settled together, though the individual pieces were still distinguishable at the two lower humidities. Those at the two higher humidities were moist, sticky or wet, streaked, and drippy. Kisses at 32 F. also settled together, but individual pieces could be pulled out.

2. CANDY GUM DROPS—Original moisture content was 15.11 percent. The gum drops were stored in duplicate at 14 of the test conditions. Two storages were omitted—80 percent relative humidity at 50 deg. F. and an 81 percent relative humidity at 86 deg. F.

Relative humidity: Gum drops were less sensitive to specific temperature and relative humidity than most candies. A relative humidity of 65 percent was found to be about best for long-time storage. This candy differed from most others in that a variation from the optimum of 8 percent in relative humidity produced no serious change in the confection after several weeks.

However, long storage at a 50 percent relative humidity, or lower, caused the candy to lose weight, shrink, become crusty and finally tough. After long storage at a 60 percent relative humidity, or higher, the candy gained weight and became soft, sticky, water-logged, and moldy.

Results indicate that quality was seriously impaired



when the gum drops either gained or lost more than 2 percent moisture. But within these limits, loss in quality was slight. Thus, gum drops with a moisture content between 13 and 17 percent were usually considered good.

Temperature: A temperature of 32 deg. F. was most satisfactory for gum drops. They became firm and the adverse effects of improper humidities were greatly reduced. When they were taken out of storage after 133 days at 32 deg. F., the candy was as good as originally. It appears that it might be stored at this temperature and a 65 precent relative humidity for an indefinite period without loss in quality.

Gum drops kept at 50 or 68 deg. F. remained in good condition for three months, provided the relative humidity was near the optimum. With humidities slightly too high or too low, changes showed up much more quickly at 68 than at 50 deg. F., and they were much more readily observed at either of these temperatures than at 32 deg. F. Low storage temperatures prevented mold growth, and greatly reduced moisture absorption and sogginess when moisture in the air was too high. And, conversely, when the moisture content of the air was too low, loss of moisture was reduced at low temperature.

There was no evidence of moisture condensation at any time on gum drops when removed from storage to room temperature. No changes in the texture and sugary coat

were apparent when there was a slight amount of moisture on the surface of the candy.

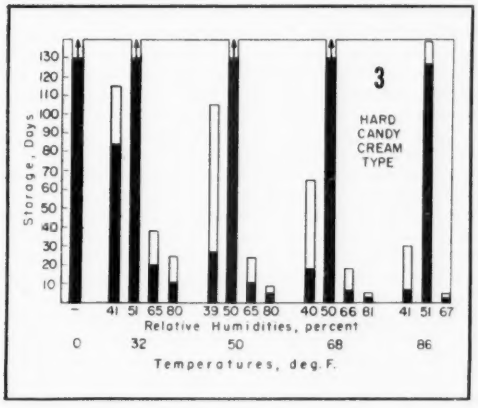
The four colors in the gum drops were stable at all temperatures and humidities where other desirable qualities were retained. Also, the four flavors were retained at all temperatures, but the lowest temperatures were best. At room temperature, or above, there was a slight loss in flavor. There was no relationship between relative humidity and retention of flavor.

3. **HARD CREAM CANDY (CANDY-CORN)**—Sugar cream or fondant is a mixture of saturated sugar syrup and finely divided sugar crystals, containing 10 to 12 percent moisture. The solubility of the sugar increases at high temperatures and at higher humidities. Thus, the firmness of the candy changes with the solubility of the sugar. And variations in humidity and temperature cause spotting of the candy due to redistribution of sugar crystals.

This candy was very sensitive to temperature and humidity. The best storage condition was about 51 percent relative humidity and 32 deg. F. Under this condition, the candy kept in excellent condition for 100 days. After 115 days, it was only slightly hard and lost 0.3 percent of its weight. Relative humidities below 50 percent brought about weight losses up to 2½ percent. At the same time, the candy became increasingly dry and hard. Finally, it was tough.

At relative humidities of about 60 perecent, the weight increased up to 4 percent. The candy lost its original finish, and it became progressively soft, sticky, soggy, runny, and finally moldy. Under moist conditions, the colors ran together and faded, and the pieces crumbled on being handled.

Low storage temperatures preserved the original flavors and colors, and retarded adverse effects attributed to improper humidity. On the other hand, storing the candies at room temperature, or higher, resulted in flavor losses and color fading. Effects of improper humidities were



noted within a few days. At a 51 percent relative humidity, hard cream candy kept in excellent condition for 100 days at 32 deg. F., for 20 days at 50 deg. F., for 4 days at 68 deg. F., and for 3 days at 86 deg. F. The influence of low temperatures on retarding the ill effects of other humidity conditions on the stored candy was in the same order, but it was less evident. There was only slight difference in the firmness of hard cream candy at different temperatures.

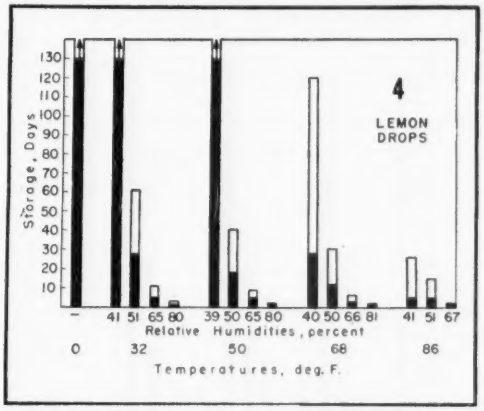
Due to the dense, glazed surface coating, condensation of moisture on the surface of this candy when removed from low temperature storage, was quite noticeable. However, the candy was in good condition after it reached room temperature and the surface dried off. Tempering this candy, by placing it at two intermediate temperatures for a short time, seems advisable.

Determination of the moisture content of the candy was helpful in evaluating its suitability to storage. When the moisture content dropped from an original 6.56 percent to 6.30 percent, the candy became hard and tough, while it might increase to 8.00 percent and still have a good texture. The "feel" of the candy is possibly the best indication of its condition under temporary storage conditions, since surface stickiness or dryness may greatly affect the saleability of the candy but may not immediately be detectable in the total moisture content.

This candy should be soft enough to be easily mashed between the fingers, firm enough to retain its shape under all handling conditions, free of stickiness, and retain its original finish and color marking as well as its full flavor.

From the results, it seems that this candy can be stored almost indefinitely at 32 deg. F. and a relative humidity of 53 percent, with virtually no change in flavor, color or weight.

4. **HARD CANDY (LEMON DROPS)**—Hard candies consist of moisture-free, super-cooled, sugar solutions of a glass-like consistency. They are usually clear and pick up some moisture during cooling and handling. As sold, they contain ½ to 1½ percent moisture. And due to their very hygroscopic nature, they can only be success-



fully stored in very dry atmospheres. Retention of the original finish, flavors, and colors, are storage problems in handling bulk or semi-bulk lots of hard candies.

Original moisture content of the test candy was 0.76 percent, and it was very hygroscopic, especially at room temperature, or higher. Storage conditions which permitted a weight change of as little as 1 percent, caused the candy to lose luster, become sugary with a dull milky appearance, and sticky enough for the pieces to cling together. With a 2 percent increase in weight, the surface became soft and cloudy, and it soon became runny and drippy. At this point, the candy was removed from the experiment.

This condition was almost entirely attributed to improper humidity conditions. Adverse effects caused by high temperatures were manifested by loss of aroma and flavor, and darkening of the candy. Lower temperatures retarded the rate at which the candy took up moisture, even at the same relative humidity.

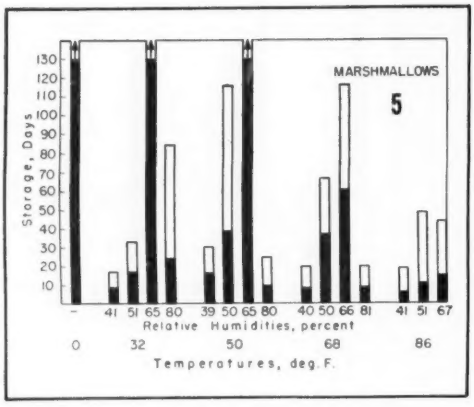
When stored at a 41 percent relative humidity, the candy remained in good condition at 86 deg. F. for about 4 days, at 68 deg. F. for 19 days, at 50 deg. F. for 27 days, and at 32 deg. F. for more than three months. At a 50 percent relative humidity, the candy remained in good condition at 86 deg. F. for 1 day, at 68 for 5 days, and 50 deg. F. for 12 days, and at 32 deg. F. for 30 days. And at 65 percent humidity, it remained satisfactory at 86 deg. F. for less than 1 day, at 68 and 50 deg. F. for 5 days, and at 32 deg. F. for only two days. None of the candies were saleable at an 81 percent relative humidity at any temperature for 1 day.

From these findings, it appears that to store this hard candy for more than two or three weeks, the relative humidity must be 40 percent, or lower. And to preserve the original color, aroma and flavor, the temperature must be 50 deg. F., or lower. The data also disclose that with a relative humidity of 40 percent, or lower, and a temperature of 32 deg. F., the candy may keep almost indefinitely.

Candy stored at 32 deg. F. was in good condition for three months. But when it was directly removed to room temperature, there was sufficient moisture condensation on it to cause stickiness. However, after the temperature equalized, the stickiness disappeared, and there were no permanent adverse effects to the candy's appearance.

It is believed that if the candy were properly packaged, or if it had been "tempered" by placing it temporarily at an intermediate temperature, there would have been no stickiness.

5. **MARSHMALLOWS**—These candies are of course, light in weight and gummy. They contain as much as 18.5 percent moisture. Because they have the highest moisture content of common candies and because they are subject to many changes in weight, texture, and shape,



storage conditions that are optimum for them are not suitable for most other candies.

High humidities bring about progressive changes—loss of finish, stickiness, runniness, fermentation, and molding. Low humidities cause marshmallows to lose weight, shrink, and become dry and crusty.

Marshmallows were stored under the 16 different temperature and humidity conditions. In the first series of tests, the 'mallows were stored loose, and in another they were stored 30 to a cellophane bag. They were removed from their packages and arranged in even rows in wire baskets for maximum exposure to the atmosphere.

Effect of humidity: In storing marshmallows, proper humidity was more important than temperature. Yet, both were so closely related that they must be considered together.

A definite advantage in storing marshmallows was that the ingredients and make-up were such that they withstood small changes without immediately being affected. The powdered sugar coating took up a certain amount of moisture without becoming soft, sticky or runny—as did hard candies or creams. Therefore, weight changes varied considerably—as compared with most of the candies tested—without being detected in their appearance.

A relative humidity of about 65 percent was found best. When stored in a drier atmosphere, the candies progressively lost weight, shrunk. They also became crusty, firm with loss of puffiness, and hard on the outside with very tough centers. On being toasted or used in a souffle, they were too crusty and tough, and the sides "cupped in." At relative humidities above 65 percent, the 'mallows increased in weight, became stickier, soft, and finally runny with molding and souring. None of them was suitable for toasting.

It was of special interest that marshmallows stored at a 65 percent relative humidity and 32 or 50 deg. F. for 115 days gained 1.5 and 1.6 percent in weight, and they appeared "like the original" in all respects.

Effect of temperature: In general, high temperatures and humidities had similar effects—softening of the marshmallows. Conversely, low temperatures and humidities had similar effects—increasing their firmness.

There was little difference in storing marshmallows at 32 and 50 deg. F. and a 65 percent relative humidity. The change in moisture content was insignificant, and the marshmallows appeared "like the original" in other respects after 115 days. Those stored at 32 deg. F. seemed firm, and they contracted while under refrigeration. But became soft and puffy at room temperature.

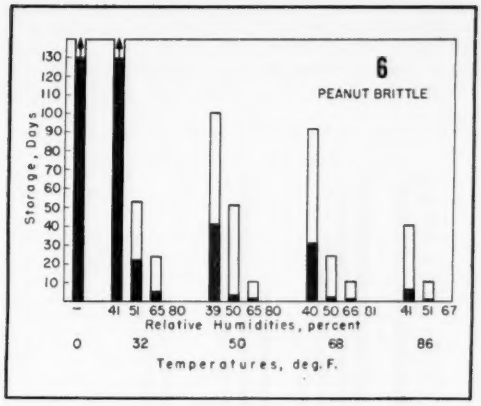
Those kept at 68 deg. F. and a 66 percent relative humidity did not pick up much moisture, and they remained very much "like the original" except for a loss of flavor. Such retention of quality would justify holding them considerably below room temperatures.

Stored in packages: Marshmallows were stored in cellophane bags as received from the manufacturer. Duplicate bags were kept under the 16 test conditions. Slight errors were introduced when some of the bags tore or cracked under dry or cold conditions.

Since the bags were not merely imperfect but inferior moisture barriers, the results under different humidities were similar to the unpackaged product. These tests confirmed the previous results—65 percent was the optimum relative humidity for storing them. Since packaged marshmallows were less exposed, they were slower to respond to improper storage conditions. But within a few weeks, the results were about the same as if they were not packaged.

Packaged marshmallows behaved similarly to the unpackaged product under different temperatures. Those stored at 32 or 50 deg. F. remained in excellent condition throughout the experiment. Those held at 68 deg. F. were good for many weeks, except for loss of flavor. And those kept at 86 deg. F. remained fresh for only a few weeks.

6. **PEANUT BRITTLE**—This hard candy with peanuts contains 1.58 percent moisture. Shelf-life of the brittle is limited by two factors—stickiness and runniness of the candy, and also staleness and rancidity of the peanuts. Stickiness was controlled by low humidity, and staleness by low temperature. By storing it at 0 to 32 deg. F. and a 41 percent relative humidity, the test candy remained saleable for 140 days.



At 32 deg. F., the texture was excellent at a 41 percent relative humidity, but a slight staleness developed after 50 days. At a 51 percent relative humidity, it became sticky and darkened in 22 days. And at a 65 percent relative humidity it took four days for the candy to become sticky and discolor.

At 50 deg. F., the texture was excellent at a 41 percent relative humidity, but the candy was stale in 42 days. At a 51 percent relative humidity, the candy became sticky and it discolored in 3 days. And at a 65 percent relative humidity, it was sticky and darker in color in 1 day.

The texture remained excellent at 68 deg. F. and a 41 percent relative humidity, but staleness took place in 31 days. At a 51 percent relative humidity, the candy became sticky and darker in color in 2 days. And at a 65 percent relative humidity, it became sticky and dark in 1 day.

The candy became soft within 4 days at 86 deg. F., even at the lowest humidity, and within a few hours at the other humidities.

Peanut brittle stored at too high a humidity became sticky, then clumpy and runny, and finally the candy ran off the peanuts. The candy increased in moisture content and then settled in the containers. When the moisture content increased to 2½ percent, the candy was too sticky to handle. And when it increased to 3 percent, it was runny.

The beneficial effects of refrigeration were two-fold: First, it stiffened the candy and hindered stickiness and runniness. Second, it retarded staling. By combining the beneficial effects of refrigeration and low humidity, the brittle may be stored for many months.

7. CHOCOLATE-COVERED NOUGAT BARS—Here, our test candies contained 6.14 percent moisture and weighed 1½ oz. Six glassine-wrapped bars were stored in duplicate under the different test conditions.

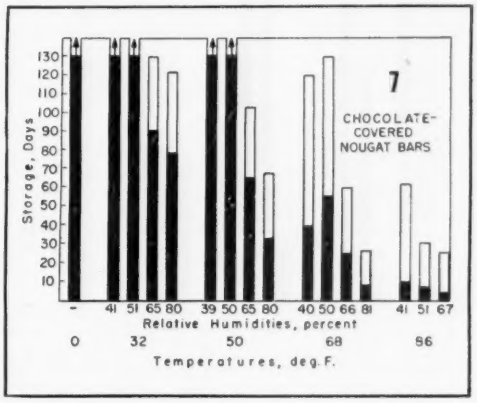
There were definite advantages in storing this candy under refrigeration. And a 50 percent relative humidity was slightly more suitable than a 40 percent. The chocolate coating protected the interior portion of the bar.

Best conditions for long-time storage were either 0 deg. F., or 32 deg. F. and a 45 percent relative humidity. Or they may be stored at 50 deg. F. and a 45 percent relative humidity for short periods.

At 32 deg. F. and 40 or 50 percent relative humidity, there were no changes in 130 days. With a 65 percent relative humidity, the texture and taste were good, but the finish became slightly dull after 90 days. At an 80 percent relative humidity, there was a slight gain in weight and the color became lighter after 57 days. After 90 days, the moisture content increased to 6.94 percent and the nougat bars became slightly sour.

There were no changes in 130 days when the temperature was 50 deg. F. and the humidities were 40 or 50 percent. With a 65 percent relative humidity, there was a slight loss of lustre in 60 days. Then, the bars became dull and had a sour odor in 102 days. At an 80 percent relative humidity, the bars became dull and moist in 32 days. And in 67 days, they were dull, musty, and slightly moldy.

Appearance did not change in 130 days when the bars were stored at 68 deg. F. and 40 or 50 percent relative humidity. But there was a strong aroma in 59 days. And in 120 days, the candy was discarded because of a stale odor. At a 65 percent relative humidity, the candy was stale in 8 days. There was no change in appearance. In 59 days, the candy was discarded because it was sour.



And at an 80 percent relative humidity, the same condition occurred in about half the time.

There was a slight loss of moisture content—from 6.14 to 5.5 percent— in 7 days when the bars were stored at 86 deg. F. and 40 percent relative humidity, but there was no change in the appearance. The candy became soft but not sticky at a 50 percent relative humidity within 7 days. And in 30 days, it was discarded because of a sour milk odor. At a 65 percent relative humidity, the structure of the candy held up well, but a musty aroma occurred in 23 days.

8. CHOCOLATE-COVERED PEANUT ROLLS—These candies were made with fudge centers, dipped in caramel (10 percent moisture), rolled in roasted, blanched peanuts, and dipped in milk chocolate. The rolls contained 5.16 percent moisture. Each roll weighed slightly more than 1 oz. The rolls were stored in waxed paper wrappers.

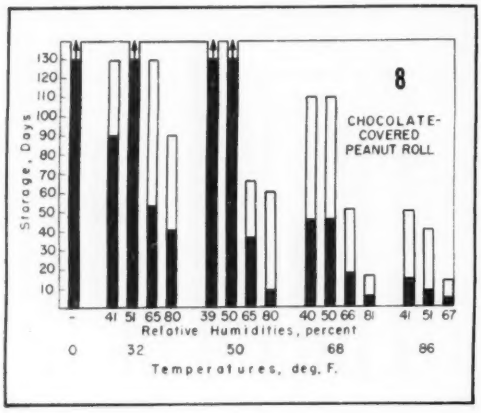
As contrasted with uncovered peanut rolls, those with chocolate coating held up much better. The coating afforded protection against stickiness of the caramel and staleness of the peanuts. However, at high temperatures or high humidities, the chocolate became soft and runny, and the caramel ran through it.

There was no change in weight or color after 90 days at 32 deg. F. and 40 percent relative humidity, but the candy turned slightly gray. At a 50 percent relative humidity, there was no change in weight or color. A slight gray cast developed at a 65 percent relative humidity after 65 days. The nuts were slightly stale after 120 days. At an 80 percent relative humidity, the rolls were dull and moist in 40 days. And in 90 days, they were moist with caramel exuding through cracks in the chocolate coating. The

moisture content of the rolls had climbed to 5.85 percent.

At 50 deg. F. and a 40 percent or 50 percent relative humidity, there was no change in weight or color after 130 days. With a 65 percent relative humidity, there was no change until 35 days, when the finish became dull and caramel exuded through the coatings. At an 80 percent relative humidity, there was a little moisture on the surface and the coating had a dull finish in 6 days. This condition gradually became worse. After 50 days, the candy was considered unacceptable.

A slight staleness and graying in color developed in 45 days when the rolls were held at 68 deg. F. and 40 or 50 percent relative humidity. And in 100 days, the rolls were



rancid. At a 65 percent relative humidity, the candy was soft in 15 days and it was discarded in 40 days due to softness and staleness. At an 80 percent relative humidity, the rolls developed a musty odor in 3 days. And in 21 days the caramel leaked through cracks in the coating.

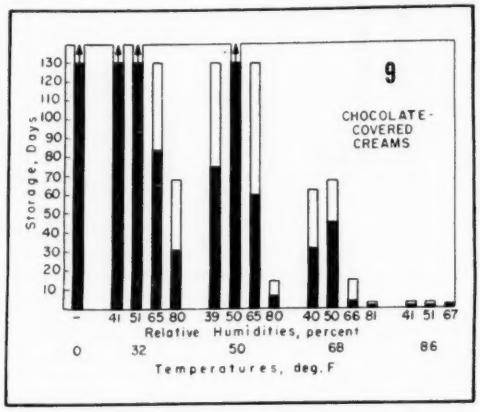
The rolls became soft in 2 days at 86 deg. F. and a 40 percent relative humidity. After 14 days they were stale. The rolls were discarded because they were running in 40 days. There was a gain in weight and caramel leaked through the coating in 9 days at a 50 percent humidity. At a 65 percent humidity, the chocolate was soft and runny in 2 days.

9. **CHOCOLATE-COVERED CREAMS**—These cast creams had an 8.09 percent moisture.

The best of the long-time test conditions was storage at either 0 deg. F. or 32 deg. F. at a 50 percent relative humidity. Under these conditions, there was no change in weight, moisture content, appearance, or flavor in 187 days. At 32 deg. F. and a 41 percent relative humidity, there was 0.3 percent loss in weight and a slight loss of gloss.

There was no change in weight at a 65 percent relative humidity, but a slight loss of finish and flavor occurred after 85 days. Small blisters formed on the surface which burst leaving scars. At an 80 percent relative humidity, there was a constant increase in weight, and light brown spots developed within 3 days. After 127 days, the moisture content had increased to 8.69 percent. The surface of the creams was dull, damp, and sticky, and the centers leaked through the coating.

There was 0.3 percent loss in weight after 160 days at 50 deg. F. and a 40 percent relative humidity. The moisture content had dropped to 7.84 percent, and a stale flavor was noticeable. A slight loss in moisture took place at a 50 percent relative humidity, but there was no change in appearance or flavor. At a 65 percent relative humidity, the creams gained weight. The finish was dull after 10 days. And the creams discolored and became sticky after two months. There was an increase in weight within 1

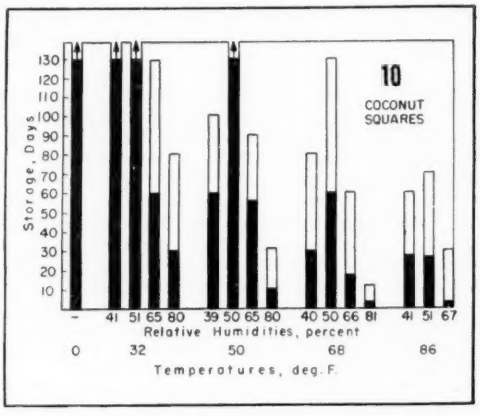


day at an 80 percent relative humidity, a loss of glossy finish in 6 days, and a soft surface with extruding centers in 10 days. At this temperature, the candies kept best at a 50 percent relative humidity.

None of the creams was saleable for more than two months at 68 deg. F., irrespective of the humidity. After about 30 days, creams were stale at all humidities. At a 40 percent and 50 percent relative humidity, there was a slight loss in weight.

Creams became runny within 1 day, at 86 deg. F., irrespective of the humidity.

10. **COCONUT SQUARES**—These are firm, oblong blocks containing about 25 percent coconut, cut to 40



pieces per pound. The squares tested were made up of five layers of four colors and flavors.

Containing 7.7 percent moisture, this candy held up best for long-time storage at a 50 percent relative humidity and 32 deg. F. For short-time storage, it can be kept at 50 deg. F. and a 50 percent relative humidity. At lower humidities, it lost moisture, became dry and hard, and

developed a crust. And at still higher humidities, the sugar coating dissolved, making the surface sticky. While the squares held their shape at 86 deg. F., they became moldy at humidities above 60 percent.

A slight loss in weight was the only change after 130 days at 32 deg. F. and a 40 percent relative humidity. At a higher humidity—50 percent— there was no change in 130 days. There was no change at a 65 percent humidity, except a slight increase in weight up to 60 days. At an 80 percent humidity, the sugar coating dissolved after 6 days, became sticky after 30 days, and dripped after 80 days.

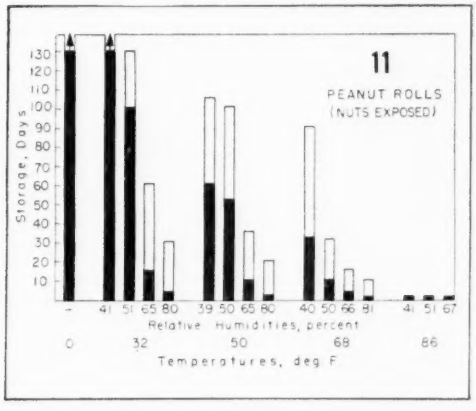
At a higher temperature—50 deg. F.—the candy had a soapy smell, lost moisture, and became dry, hard and crusty within 60 days with a 40 percent humidity. There was no change at a 50 percent humidity in 130 days. With a 65 percent humidity, the shape and colors were unchanged. But there was a gain in weight and a soapy smell after 2 days, and a soft, wet surface after 50 days. The candy then became sticky and musty after 80 days.

At 68 deg. F. and a 40 percent relative humidity, the candy lost weight and had a soapy odor after 6 days. The surface had a hard crust after 26 days. This crust became very hard after 65 days, when the moisture content dropped to 5.58 percent. The shape and colors were good at a 50 percent humidity, but there was slight loss in flavor after 60 days.

At a 65 percent humidity, there was a soapy odor and syrupy surface after 6 days. The surface looked damp after 10 days, and it was objectionably sticky after 60 days. When held at an 80 percent humidity, the candy became damp and had a stale odor after 3 days. It became soft and musty in 6 days, and moldy in 14 days.

When stored at 86 deg. F. and a 40 percent humidity, there was rapid loss in weight and a slight change in flavor. Shelf-life of the candy was about 30 days. At a 50 percent humidity, the texture and colors were satisfactory, but stale odors and flavors limited the shelf-life to about 40 days. With a 65 humidity, the sugar coating dissolved within 3 days, and a musty, soapy odor followed. Surface was moldy in a month.

11. PEANUT ROLLS (NUTS EXPOSED)—These confections were made with fudge centers, dipped in caramel (10 percent moisture), and rolled in blanched peanuts. Moisture content was 5.89 percent. Each roll weighed about 1 oz. Storage was in the oiled paper wrappers.



This candy was one of the most difficult to store satisfactorily because the caramel is sensitive to heat and moisture, and the peanuts readily stale. Only at test conditions—0 and 32 deg. F. with a 40 percent relative humidity—would it keep for 130 days.

At 32 deg. F. and a 40 percent relative humidity, there was a slight gain in weight, otherwise the candy was excellent. With a higher humidity—50 percent—the caramel was runny in 90 days, and it was too soft to handle in 120 days. Then, at a 65 percent humidity, it was sticky in 4 days at an 80 percent humidity, and runny in 30 days.

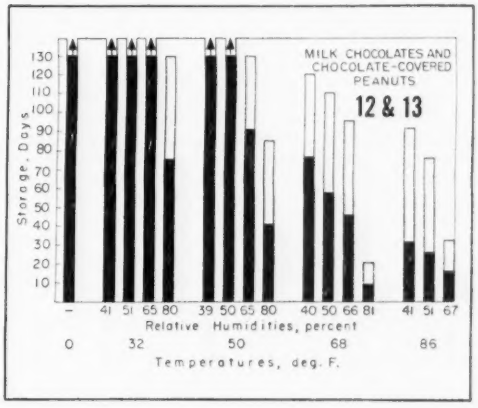
When stored at 50 deg. F. and either a 40 or 50 percent humidity, the caramel was sticky in about 50 days and runny in about 90 days. At a 65 percent humidity, it was sticky in 10 days and it ran off the bar in 35 days. The candy was satisfactory for less than 2 days at an 80 percent humidity.

At 68 deg. F. and a 40 percent humidity, the candy lost a little weight. It became stale in 30 days, and turned rancid in 80 days. It became sticky in 10 days, and both stale and runny in 15 days when stored at a 50 percent humidity.

Irrespective of the humidity, the candy became soft and runny within 1 day at 86 deg. F.

12. MILK CHOCOLATES—Miniature, sweet milk chocolate bars, which had been cut into squares and wrapped in aluminum foil, then overwrapped with flint glazed paper, were stored immediately after they were received. The squares had a glossy finish and contained 0.52 percent moisture.

These bars differed from most candies in two respects: First, although they had a very low moisture content, they were slow to pick up moisture and only a small amount of it brought equilibrium with the surrounding atmosphere. But once moisture was absorbed, the candy immediately became soft. Second, under certain conditions, these bars became moldy with a much lower moisture content than most candies.



The foil wrapper provided excellent protection against moisture absorption. Best conditions for long-time storage was either 0 or at 32 deg. F. with a 50 percent relative humidity. For short-time storage, the 50 deg. F.-50 percent r. h. condition was found best.

There were no changes at 32 deg. F. and a 40 percent humidity in 130 days. At a 50 percent humidity, the chocolates gained a little weight and darkened. Then, at a 65 percent humidity, there was an 0.4 percent gain in weight, discoloration, and a strong taste in 100 days. And at an 80 percent humidity, a sour milk aroma

developed in 48 days, and the surface had become damp and streaked.

No changes occurred in 180 days at 50 deg. F. and a 40 percent humidity. There was a slight gain in weight at a 40 percent humidity in 95 days. At a 65 percent humidity, a little moisture was picked up and a sour odor was noted in 30 days. In 95 days, the chocolates were rancid. The chocolates were sour and musty at an 80 percent humidity in 20 days.

Within 40 days, there was no change in appearance or weight when chocolates were held at 68 deg. F. and a 40 percent humidity. But in 90 days, there was a pronounced stale odor. The moisture content increased to 0.97 percent at 50 percent humidity in 40 days. And in 90 days, there was definite evidence of sour milk. At an 80 percent humidity, there was a musty odor and discoloration in 3 days. And in 20 days, the moisture content had increased to 1.8 percent, and a moldy odor was detected.

In 1 day, there was softening and sticking of the chocolates when they were held at 86 deg. F. and a 40 percent humidity. A strong odor was noted in 20 days. And in 25 days, a sour milk odor was detected. Conditions were almost the same at a 50 percent humidity. But at a 65 percent humidity, a soft texture, musty odor, and dull finish occurred within 6 days—and rapidly grew worse.

13. CHOCOLATE-COVERED PEANUTS—Roasted and blanched peanuts heavily coated with milk chocolate contained 0.91 percent moisture.

This confection was one of the easiest to store. Under six of the different storage conditions, it retained its quality for 130 days. And the chief reason it was taken out of storage was due to the development of staleness at higher temperatures. However, a relative humidity of 65 percent, or higher was unsuitable for long-time storage at all temperatures used. This candy remained in good condition for a longer period at an 80 percent humidity than any other.

No changes took place at 32 deg. F. and a 40 or 50 percent humidity. At a 65 percent humidity, the moisture content increased to 1.36 percent in 95 days. At an 80 percent humidity, the pieces held their shape well, the color was slightly darker, and the moisture increased to 2.09 percent.

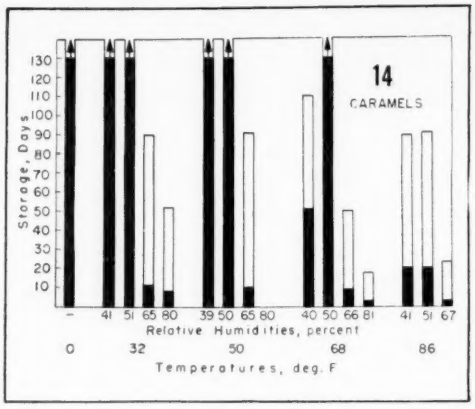
There were no changes at 50 deg. F. and a 40 or 50 percent humidity in 130 days. But at a 65 percent humidity, the candy gained up to 2.23 percent moisture in 90 days and became slightly stale. Then at an 80 percent humidity, the candy was stale and gained up to 3.22 percent moisture in 49 days.

The appearance was unchanged at 68 deg. F. and a 40 percent humidity, but a stale odor was noted in 76 days. Rancidity was evident in 120 days. At a 50 percent humidity, the same changes took place, but about 10 days sooner. The candy was grayer at a 65 percent humidity, and it had a stale odor in 48 days. Then at an 80 percent humidity, the candy became darker, soft, and musty within 4 days. It was moldy in 20 days.

Chocolate-covered peanuts became darker, slightly soft and musty within a few days at 82 deg. F., irrespective of the humidity. However, they became moldy at higher humidities within about 15 days, but remained edible at the lower humidities for more than 50 days. In 30 days, the moisture increased to 2.75 percent at a 50 percent humidity and 4.00 percent at a 65 percent humidity.

14. CARAMELS—These candies were vanilla flavored, contained 9.04 percent moisture, and were cut into squares—32 per pound. Each square was wrapped in waxed paper.

These confections kept well over a wide range of temperatures and humidities. Chief problem encountered was softening due to high temperatures or humidities. The wax wrapper provided good protection.



Best conditions for long-time storage were either 0 or 32 deg. F. at a 45 percent humidity. For short-time storage it was indicated the caramels may be held at 50 or 68 deg. F. and a 50 percent relative humidity.

There was no change in 130 days at 32 deg. F. and a 40 or 50 percent humidity. At a 65 percent humidity, the caramels were slightly sticky in 50 days, and very sticky after 90 days, when they were discarded. Caramels were sticky in 3 days at an 80 percent humidity. And in 57 days, they were so soft that they had to be discarded.

No noticeable changes took place at 50 deg. F. and a 40 or 50 percent humidity after 130 days. But at a 65 percent humidity, the caramels became sticky in 8 days. And after 100 days, they were discarded because of stickiness and softness.

There was a slight loss in weight at 68 deg. F. and a 40 percent humidity. The moisture content dropped to 8.03 percent, the caramels became brittle, and they crystallized in 130 days. At a 50 percent humidity, there was no change in color or flavor, although there was some sugar crystallization.

The caramels became sticky in 8 days at a 65 percent humidity. And in 59 days, they were soft and grainy, and they picked up a little weight. After holding them at an 80 percent humidity, they were sticky in 2 days. And in 17 days, the caramels were discarded because they were soft and sticky.

The caramels lost weight after 2 days at 86 deg. F. and a 40 percent humidity. Within 10 days, they crystallized and became crisp and brittle. There was no change in weight at a 50 percent humidity, but crystallization took place more rapidly. At a 65 percent humidity, the caramels were sticky in 2 days. And in 23 days they were too soft, sticky and grainy for further use.

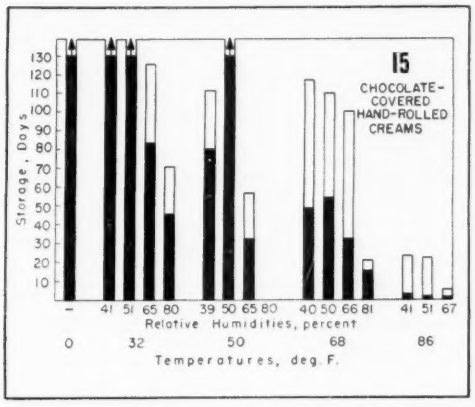
15. CHOCOLATE - COVERED, HAND - ROLLED CREAMS—These soft-centered, chocolate-covered creams, had raspberry and vanilla flavor. The hard coating of bitter chocolate provided protection against moisture and high temperatures. Due to the relatively high moisture content of these creams, they kept slightly better at 50 percent relative humidity than at 40 percent. The best condition for storing was either 0 or 32 deg. F. at a 45 percent relative humidity, or at 50 deg. F. and a 50 percent relative humidity.

There was no change in weight at 32 deg. F. and a 40 percent humidity, but small blisters formed in the

chocolate coating. No changes took place at a 50 percent humidity in 130 days. But at a 65 percent humidity, there was a slight gain in weight. And in 130 days, there was a dull finish and gray cast. At an 80 percent humidity, the surface was dull and sticky in 8 days. After 57 days, the surface was very dull and too damp for further storage.

Staling and a very slight loss in gloss took place in 130 days. This condition was practically unchanged at a 50 percent humidity. But at a 65 percent humidity, the candy was slightly darker and sticky in 8 days. In 32 days, it was very dull. And in 67 days, there was a loss of aroma, discoloration, and a dull finish.

At 68 deg. F. and a 40 percent humidity, there was a little loss in weight. In 59 days, small blisters formed



in the chocolate. And in 127 days, the candy was very stale, and it had small blisters. After 130 days, there was no visible change in the appearance, color, or aroma at a 50 percent humidity.

With a 65 percent relative humidity, small blisters were noted on the coating in 31 days. And after 120 days, the candy was stale, but it did not gain weight. The candy became damp and it had a musty odor after 17 days at an 80 percent humidity. And in 20 days, it was discarded.

All of the samples became soft within 1 day at 86 deg. F. Those stored at a 40 and 50 percent humidity, collapsed from the bottom and became very stale in 23 days. And those kept at a 65 and 80 percent humidity, cracked and lost the centers within 6 days.

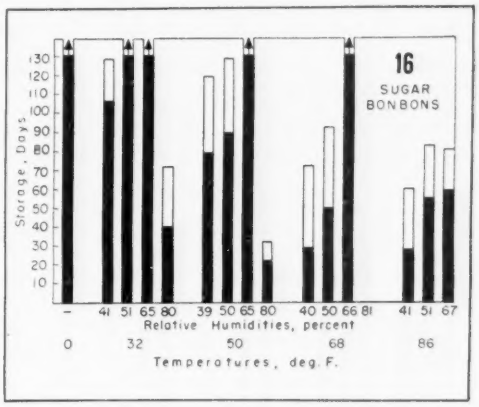
16. SUGAR BONBONS—This candy contained about 80 percent sugar (with corn and invert syrups) and egg albumin. Moisture content was 7.53 percent.

It proved to be one of the easiest candies to store, except that the colors and flavors faded at high temperatures or high humidities. It withstood higher temperatures and humidities for longer periods than most candies containing chocolate, coconut, or other nuts. And because of its high cane sugar content, it did not melt easily.

Best conditions for long-time storage were either 0 or 32 deg. F. and a 65 percent humidity. For short-time storage, it may be held at 50 or 68 deg. F. and a 65 percent humidity.

At 32 deg. F. and 40 percent relative humidity, it gradually lost moisture and became whiter, with a slight loss of flavors and colors. In 100 days, the moisture content dropped to 6.79 percent. After 130 days at a 50 or 65 percent humidity, there were no objectionable changes. But at an 80 percent humidity, the candy was slightly damp in 59 days, and it gained up to 8.4 percent weight in 80 days.

Moisture content dropped to 6.13 in 80 days at 50 deg. F. and 40 or 50 percent humidity. The colors were also slightly bleached. There were no noticeable changes



in 130 days at a 65 percent humidity. But at an 80 percent humidity, the candy became damp, less sugary and glazed in 32 days.

There was a little loss in color and weight in 32 days at 68 deg. F. and a 40 percent humidity. In 80 days, these changes were marked, and the candy had to be discarded. At a 50 percent relative humidity, there were greater changes in flavor and color after 59 days. And in 100 days, these changes were so great that the candy had to be discarded.

At a 65 percent humidity, loss of colors and flavors was slightly more rapid. The candy was damp and slightly soft in 8 days at an 80 percent humidity. It was discarded after 31 days because it was wet.

At 85 deg. F. and a 40 percent humidity, the candy was hard and lost weight in 23 days. In 59 days, the moisture content was 4.89 percent, the colors bleached, the flavors were weak, and the candy was discarded. At a 50 percent humidity, candy was hard and dry in 59 days. And in 82 days, it was dry, faded and stale. The same fading of colors and flavors, and staling occurred at a slightly more rapid rate at a 65 percent humidity.

17. SEMI-SWEET CHOCOLATE SQUARES—These chocolates were molded in 1/5-oz. squares, individually wrapped in aluminum foil, and packed in lots of 24 in heat-sealed double-wall cellophane bags. Individual squares contained 0.36 percent moisture.

For storage tests, some were left in the cellophane bags, while others were taken out. The foil was left on all of the candy. There were occasional cracks in the foil which permitted absorption of moisture and subsequent growth of molds. This absorption ran as high as 2.11 percent moisture, as compared with other blocks absorbing only 1.83 percent. Mold growth took place only at temperatures above 38 deg. F. and relative humidities above 65 percent. There was no mold growth at 32 deg. F., regardless of variation in humidity.

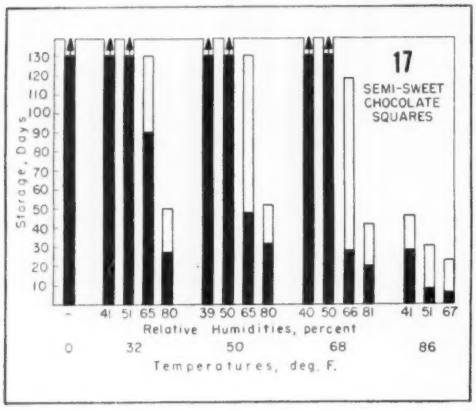
Graying of the chocolates was induced by a warm, dry atmosphere. And it developed within a few days, once this condition was reached. Graying of the candies occurred in and out of cellophane bags. It was noted

that the amount of the discoloration was influenced by temperature and humidity. Graying did not occur at 68 deg. F. or lower. Nor did it take place at a 65 percent humidity or higher.

Best conditions for long-time storage was at 0 or at 32 deg. F. and a 45 percent relative humidity. And for short-time storage, the chocolates can be held at 50 deg. F. and a 45 percent relative humidity. They can also be held at room temperature and low humidities for 8 weeks.

There were no changes within 130 days at 32 deg. F. and a 40 or 50 percent humidity. At a 65 percent humidity, there was a slight loss of gloss. Weight did not change at this high humidity.

At 50 deg. F. and a 40 or 50 percent humidity, there were no changes. Gray spots developed in 50 days at a 65 percent humidity, but there were no other changes.


17
SEMI-SWEET CHOCOLATE SQUARES
Storage, Days
130 120 110 100 90 80 70 60 50 40 30 20 10
– 41 51 65 80 39 50 65 80 40 50 66 81 41 51 67
Relative Humidities, percent
0 32 50 68 86
Temperatures, deg. F.

The color became darker at an 80 percent humidity, and there was a gain in weight with a slight mustiness in 30 days. And in 60 days there was a very musty odor.

There were no changes at 68 deg. F. and a 40 or 50 percent humidity. The chocolates were slightly spotted and stale in 30 days at a 65 percent humidity. And in 117 days, they were musty, stale and considerably moist. At an 80 percent humidity, they were spotted in 30 days. In 50 days, they were dull, dark and stale, and they had a moldy aroma.

The chocolates were stale after 23 days at 86 deg. F. and a 40 percent humidity. And in 30 days, they were very gray. At a 50 percent humidity, they were a little sticky and soft in 7 days. In 23 days, the aroma was strong and the moisture had increased to 1.5 percent. And in 30 days, all of the chocolates were gray.

The chocolates were soft and slightly sticky in 7 days at a 65 percent humidity. In 23 days, they were stale and dull in appearance. However, they did not gray at the 86 deg. F.-65 percent r. h. condition.

18. FUDGE—Moisture content of this candy was 10.21 percent. The flavor held up well under most conditions, but the firmness changed directly with the temperature. The confection became hard at low temperatures and soft at high temperatures, irrespective of the humidities.

Best conditions for long-time storage were the 0 to 32 deg. F. temperatures and a 65 percent relative humidity. It may also be held at room temperature for 8 weeks, provided the humidity is 65 percent. General storage conditions are similar to those most suitable for marshmallows and gum drops.

There was a hardening and a slow drying at 32 deg.

■ The findings reported here exemplify results to be obtained through the cooperative enterprise of related agencies within the food industry. In this case the National Confectioners' Assn., the Refrigeration Research Foundation, and the Georgia Experiment Station joined forces to provide valuable data to the confectionery industry on one of its most perplexing problems—the refrigerated storage of candies.

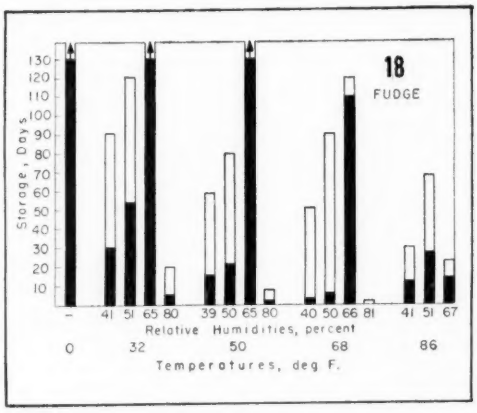
F. and 40 percent humidity. These changes were quite evident in 30 days. And after 90 days, the fudge was discarded because it was very hard and dry. At a 50 percent humidity, drying and hardening took place about half as rapidly. There were no noticeable changes after 130 days at a 65 percent humidity. But at an 80 percent humidity, the fudge was damp in 2 days, and it was moist and soft in 7 days. Fudge was discarded after 30 days.

The fudge became drier and it hardened at 50 deg. F. and a 40 percent humidity. These conditions were noted in 15 days. And in 60 days, the fudge was rejected—it was too hard. At a 50 percent humidity, similar drying of the fudge occurred in about one-half the time.

There were no noticeable changes after 130 days at a 65 percent humidity. But at an 80 percent humidity, the candy was damp in 2 days and it was discarded in 7 days because it was soft and sticky. However, the flavor was still good.

There was noticeable loss of weight or drying out in 2 days at 68 deg. F. and a 40 percent humidity. In 50 days, the fudge was too hard and it was disposed of. The flavor, however, was still good. At 50 percent humidity, drying occurred at about one-third the rate. A very slight drying and loss of flavor occurred at a 65 percent humidity. And at an 80 percent humidity, the candy was soft, wet, and drippy in 2 days.

The candy first became soft at 86 deg. F. and a 40 percent humidity, but gradually hardened. In 15 days,

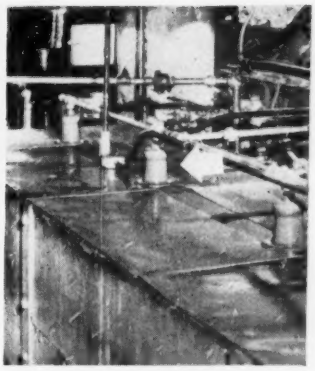


drying was quite noticeable. And in 30 days, the fudge was excessively hard, dry, and crusty. At a 50 percent humidity, drying was slower, but the candy became "sugary." There was also a loss of flavor, and the color darkened. After 68 days, the candy was discarded. No change in moisture content took place at a 65 percent humidity. But in 15 days, the candy had less flavor and a darker color. And in 23 days, the candy was much darker, softer and stickier.

Discharge Nozzles Guard Danger Spots—

On Conveyors

At Entrance to Fryers



And Inside Supply Tanks

No Foothold for Fire On This Line

Baker never gives a flash flame a chance—an example for other food processors who wish to steer clear of our industry's $6,000,000-plus fire toll

W. E. MORGAN, JR.
Manager, Industrial Division,
Walter Kidde & Co., Inc.

For a very convincing illustration of how food processors can make fire protection pay triple—as an investment, production, and profit safeguard—take the case of Philadelphia's Hygrade Bakery Co. This company heeded the sober facts and then acted.

And those food-company fire facts are well worth heeding: During 1949, the food industry was one of the largest losers to fire. Of 218 large-loss fires, each destroying more than $250,000 worth of property, the food industry suffered a total of 16 in which 22 persons perished and more than $6,000,000 worth of plant and equipment went up in smoke.

These unpleasant facts are from the National Fire Protection Assn. records. Also to be taken into account are the hundreds of smaller fires that exact a huge annual toll among food processing and storage plants. Yet there remains this important truth—

■ **Most destructive fires in industrial plants start as small fires—which can be prevented if management provides adequate fire protection.**

Briefly, it's a matter of gaging the plant's specific needs and shaping a pattern of protection to fit. And here, the steps taken by Hygrade are in point.

This bakery is a leading producer of potato chips and cocktail cheese sticks, cooked and packaged in a highly mechanized processing plant. With the potato chips fried in oil at high temperature, there is constant danger of flash fire. Ignition of the cooking oil from an electric spark, or other cause, could launch a serious fire that might destroy the whole plant and all its costly processing equipment.

To guard against such an emergency, the company called in engineers of Walter Kidde & Co., who then designed and installed an automatic fire extinguishing system, employing carbon dioxide as the extinguishing agent.

Carbon dioxide was chosen as the agent because it is a sure fire-killer of flammable liquid blazes. Moreover, it is a non-conductor of electricity, and also an inert gas which does not adulterate the food being processed or harm the processing equipment. Nor does it leave any messy residue.

The processing equipment in the Philadelphia plant comprises three deep oil cookers—two for potato chips and one for cocktail cheese sticks—with integral conveyors that carry raw food through the cooking vats to drainboards and on to the packaging point.

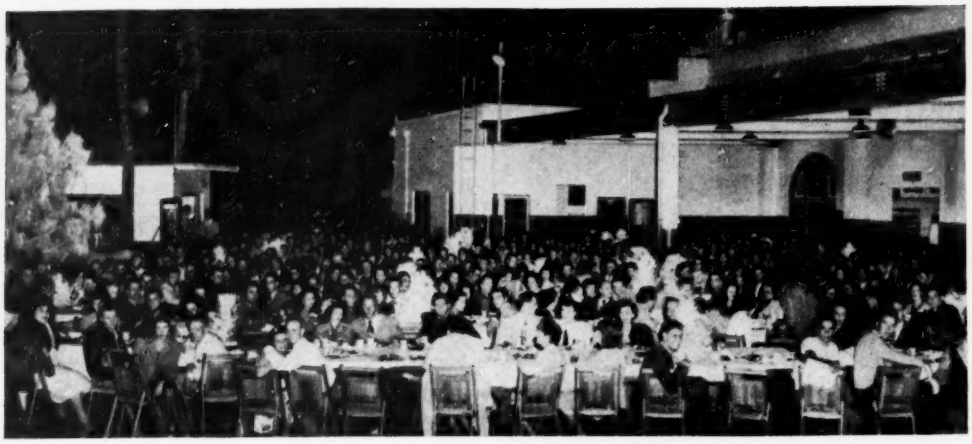
The new extinguishing system protects each potential source of fire along the processing path. A series of 36 discharge nozzles, connected by piping, is installed at strategic points ready to discharge the fire-smothering CO_2 into the cooking vats, oil supply tanks, and onto the open conveyor surfaces of both machines. Nine thermostatic detectors are placed at fire hazard locations on the two machines.

Thermostats and discharge nozzles are connected by electrical wiring and rigid piping to the discharge heads of the CO_2 cylinders supplying the system. Ten supply cylinders, each containing 50 lb. of liquid CO_2 under high pressure, are manifolded together and enclosed in a protective wire cage near the potato chip and cheese stick machines that they guard.

In case of fire, whether in oil vats, drainboards, or conveyors, the thermostats instantly signal the alarm and open cylinder discharge valves. Under its own power, the carbon dioxide rushes through the piping and out the discharge nozzles. Expanding to 450 times its stored volume, the inert heavier-than-air gas engulfs the blaze and smothers it quickly and safely.

Pressure of the discharging CO_2 actuates three trips in the pipe line. And they, in turn, automatically close ventilating dampers in ducts above the oil-cooking vats. Four switches also operate on system discharge to shut down all electrical equipment driving the chip processing machinery.

Before the installation of the new equipment, states Superintendent V. A. Weil, a flash fire could have resulted in the loss of two days' production and approximately 2,000 lb. of oil. But now, oil loss from any blaze will be minimized, and no more than 15 min. production time will be lost.



PARTIES for employees are held at Christmas in the spirit of one big happy family. Parties with entertainment, plant tours and door prizes are held regularly for plant-visiting groups of 700 to 1,800 people.

Modernizes Management and Processing

Advanced employee and public relations methods introduced by Florida baker set industry pace, as does new automatic bread plant

R. E. CHIVERS
Assistant General Manager,
Fuchs Baking Co., South Miami, Fla.

It is the aim of management at Fuchs Baking Co., South Miami, Fla., to make its public and employee relations as modern as the company's new up-to-the-minute bread bakery. And efforts to create and maintain good-will—both in the plant and on the outside—have paid off in a steadily increasing business, happy and productive workers, and prestige.

Fuchs really works at its public relations. It holds public parties every summer, during the months of May, June, July and August. Local groups, such as dormitory students at the University of Miami, are invited. Other guest groups are employees in the Post Office, banks, department stores, dairy plants, and other business organizations. At least 700 to 800 people attend each of these parties, and the number has run as high as 1,800.

The parties are staged in a large open patio surrounded by the bakery's buildings. The affairs begin at 7:30 p.m., at which time twelve specially trained hostesses take the guests through the bakery in groups of ten. After the plant trip, the visitors are served fish sandwiches, hot dogs, coffee and fresh orange juice. Then they are entertained with a 1½-hour local-talent floor show.

Another part of the company's public relations operations are two plant tours a week for local children, during school hours, sweet rolls being served at the end of the tours.

A more limited, but unusual, public relations operation is the good work which the bakery advertising manager does with students taking the advertising course at the University of Miami. He instructs these students in the basic principles of Fuchs' advertising, then the students are shown through the bakery. After this, they work out a proposed advertising program for the bakery's Holsum products as part of their classroom activities.

The bakery benefits three ways from this activity. Students become acquainted with the company, its products and its management methods. The company sometimes gets valuable ideas for advertising from the students. And university graduates are produced who have a fairly thorough understanding of the bakery's merchandising and public relations practices and problems. Incidentally, the advertising budget of the bakery was increased 1,500 percent between 1931 and 1950.

Another effective public relations activity at Fuchs is elaborate decoration of the bakery at Christmas. This is a local spectacle which attracts people for miles around. An impressive array of Christmas lights and symbols decorate the front of the building. Last year, the Christ-in-the-manger scene was the central motif, and on either side were miniature pews and figures representing people in church. Organ music added a realistic touch. As many as 85,000 people have come to see these decorations, policemen being required to handle the traffic.

Another festivity in which the company takes a prominent part is the celebration preceding the Orange Bowl football game. Fuchs always has a large Holsum bakery float in the parade.

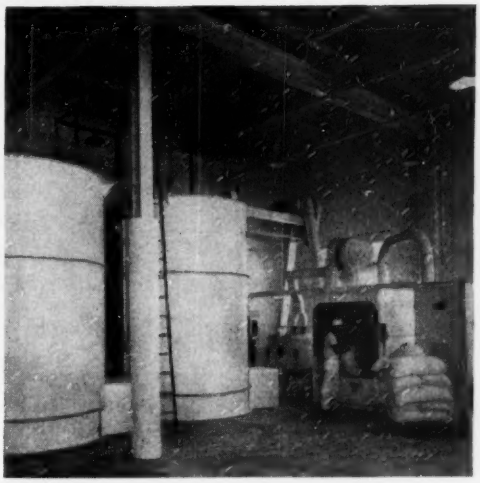
Still other public relations activities include billboard posters using "snipes" to promote worth-while local civic affairs, Christmas cards showing the Xmas decoration of the building, and a household hints booklet.

Good Employee Relations

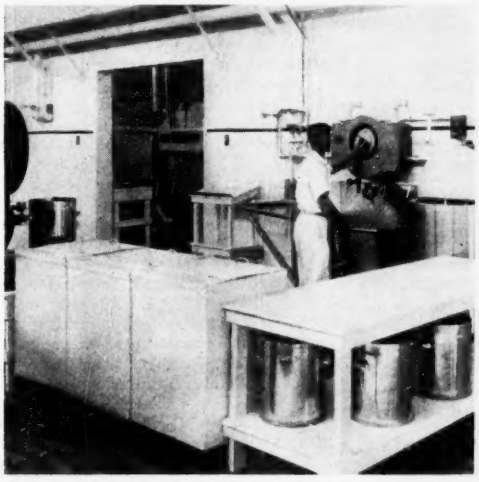
One does not have to spend much time in the bakery to realize that the employees are happy, friendly people. This does not happen by accident, but

New Bread Bakery Is Among Most Modern Food Plants

BOTH LABOR and storage space are saved at the bakery by moving and stacking barrels, drums, and bags on pallets with the aid of gasoline powered lift trucks.



DELIVERED to line on pallets, bags of flour are emptied into blender-sifter, flour is sucked from bag walls, and ingredient goes to two 90-bbl. storage bins.



BREAD INGREDIENTS other than the flour and water are put together precisely in the area adjacent to the mixing department. A pre-set flowmeter is used.

TWO stationary bowl mixers equipped with direct-expansion cooling, flour scales, and dough trough elevator. Fuchs makes point of keeping everything spic and span.

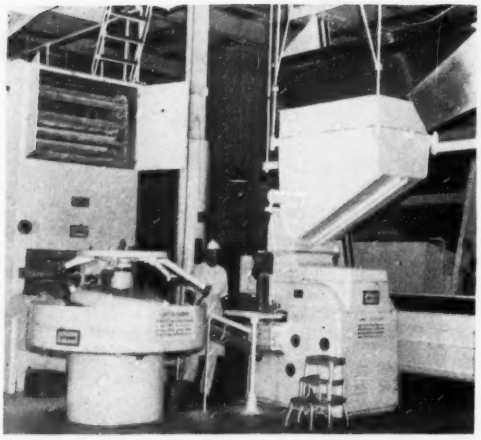
is the result of effective employee relations.

The company uses its own merit system for rating all employees every fourth week. Demerits are handed out when a person "falls down on the job,"—doesn't do his or her part in maintaining production efficiency, keeping the plant sanitary, and cooperating for friendly relations among workers. Merits are received for doing a good all around job and extending a helping hand to others when time and the situation permit.

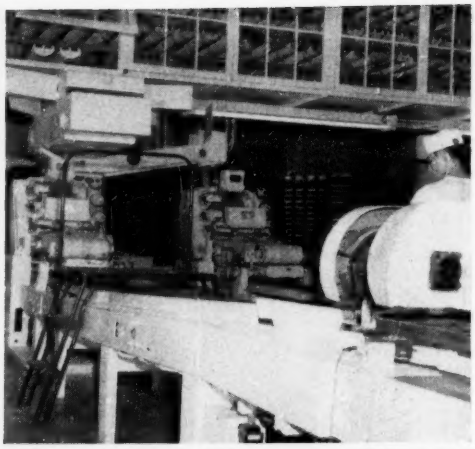
Merits and demerits for workers are given by foremen, while those for department heads are handed out by the general manager. But executives can recommend merits for any employee in any department—and they frequently do.

Fuchs has a pension plan, too. It provides a monthly income based on the calculation of 0.75 percent of the employee's monthly basic earnings when he enters the plan, multiplied by the number of years of past service. To this is added 1 percent of the monthly basic pay multiplied by number of years of "future" service before retirement at 65. Employees with the company 5 years qualify for the plan.

The company has a monthly house organ to keep employees informed about activities, and about other people in the company. It explains the whys and wherefores of departmental changes, and other important plans, so that workers will understand and cooperate. Also issued are booklets explaining worker benefits and describing plant operations.



TROUGHS of dough are dumped by hoist into divider (right). Loaf-size pieces of dough discharge from divider into rounder, then go into first proofer (left).



PROOFER discharges alternately into two molder-panners that operate automatically. Pan transfer separates one line of pans into two for these machines.

Fuchs has a credit union and a mutual aid financial program too. In addition, it pays higher wages than others in its area, and it takes the small-community helping-hand attitude toward the personal problems and difficulties of employees.

To sum it all up, the company makes its bakery a pleasant and profitable place to work. And employees respond by working for, instead of against, the company.

Advanced Production Methods

There is no more modern bakery in the United States than the new million dollar, 6,000-lb. per hr., automatic bread plant at Fuchs. And ingenious production-speeding devices have been developed for the variety products lines in the old part of the bakery.

Incoming ingredients for both plants are handled efficiently on pallets by gasoline-driven lift trucks. Carloads of bagged flour come in on a railway spur a short distance from the bakery, so direct loading onto a shipping platform is not feasible. Therefore, bags are stacked on pallets, transferred by lift truck to a large flat-bed automotive trailer, hauled to the plant, and then unloaded and placed in the storage room by lift trucks. Even barrels of milk powder and drums of shortening are handled on pallets.

Two high-lift trucks—1- and 1-¾-ton—do the handling work. These trucks stack flour 3 pallets, or 15 bags, high. When the job was done by hand, the stacks were only 10 high. So the new system saves one-third in storage space. Drums and barrels are now stacked 3 high, where they used to be only 1 high, saving two-thirds in space. The labor saving is appreciable.

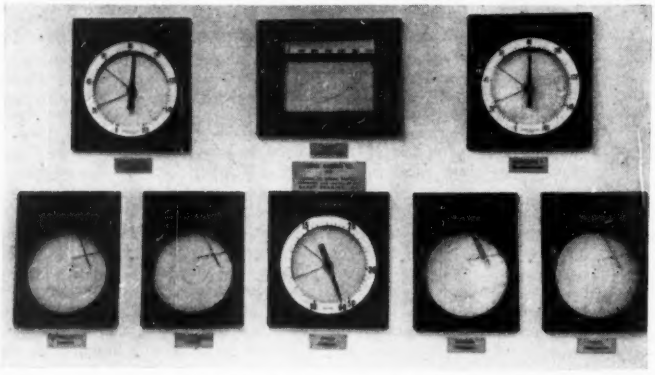
Movement of flour from warehouse to production line is by lift truck. In the plant, the bags are emptied into a hopper, and the flour is removed from the bag walls by a suction cleaner that empties into a dust collector. The flour passes through a blender and gyratory sifter, then is conveyed by bucket elevator and screw conveyor to two 90-bbl. cylindrical steel storage bins. These bins will supply the production lines for two or three hours, providing flexibility in bag-dumping operations. From the bins, the flour is screw-conveyed to electric weigh hoppers over the mixers. Water is metered into these mixers by automatic flow meters of the pre-set type, and a similar meter is used in the ingredient make-up department adjacent to the mixing room. Here the yeast, enriching materials and malt are mixed and emulsified.

The dough is mixed in two electrically timed, stationary bowl mixers, one of 1,300 lb. capacity, the other 1,600 lb. These are equipped for direct expansion cooling, the mixed sponge being dumped into 1,000-lb. troughs, which are rolled on casters into the air-conditioned fermenting room.

After 3½ to 6 hr. of fermentation, depending upon amount of yeast, the troughs are rolled out to the dough mixers, also of the stationary-bowl type. Here, electrically driven screw hoists lift the troughs above the mixer and dump the sponge into the machine. Other ingredients, such as yeast and salt, are added, and the dough is mixed about 10 min.

After a rest period in the fermentation room, the dough—again in troughs—is moved to another screw hoist that empties the troughs into a divider equipped with an air dryer

Mechanical Eyes: Automatic Controllers and Recorders



Battery of control and recording instruments in plant superintendent's office is important tool in process and quality control.

to eliminate dusting flour. From there, the loaf-size dough pieces go to a rounder which shapes them and applies dusting flour to form a thin gas-sealing skin over the surface. Then the pieces are fed by conveyor into the trays of an automatic overhead double-lap proofer with a dual discharge that feeds two molder-panners. The dough remains in the proofer approximately 10 min. to allow it to "loosen-up" for molding.

Automatically placed into pans moving on two parallel lines, at the rate of 96 loaves a minute by the molder-panners, the dough is ready for the final proofer. To get the dough into the proofer from the two lines, an automatic transfer conveyor feeds pans from one of the conveyors onto the other, a photoelectric traffic controller preventing jamming. Moving on a single conveyor, the pans feed onto the loading station of the final proofer, and are automatically pushed onto the proofer shelves. As they leave the final proofer about an hour later, the pans are automatically loaded into the 105-ft. traveling oven and baked 25 to 30 min. Manual handling enters the production cycle momentarily at the oven discharge end, where workers dump the loaves from the pans.

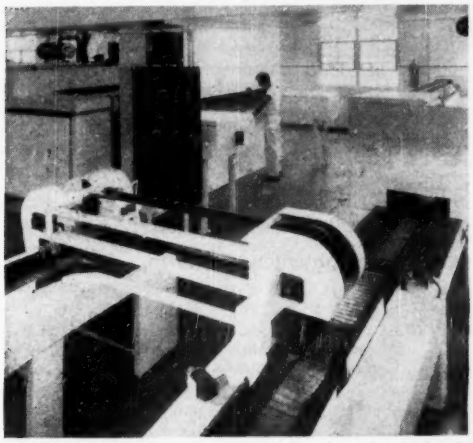
At this point, the bread goes by conveyor to a cooler, and the empty hot pans are conveyed through a second cooler.

The pan cooler consists of a long tunnel through which a blast of air is blown by fans. The pans leave this tunnel on a conveyor leading back to the molder-panning machines.

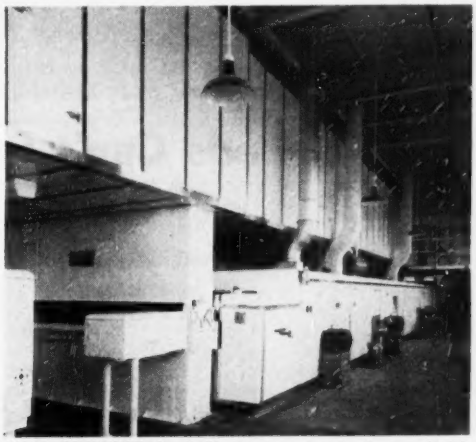
The bread cooler is a large, overhead traveling shelf-type unit through which air is circulated by fans to reduce the bread temperature to 90 deg. to avoid moisture condensation inside the wrapper. After leaving the cooler, the loaves are carried by conveyor onto a long U-shaped traveling sorting table, and from there are fed by hand into four lines of slicers and wrappers. The waxed wrappers are heat-sealed and the ends passed over a refrigerating coil to chill the seal.

The wrapped bread is put in boxes and placed on a long power-driven conveyor extending transversely across the entire width of the truck loading

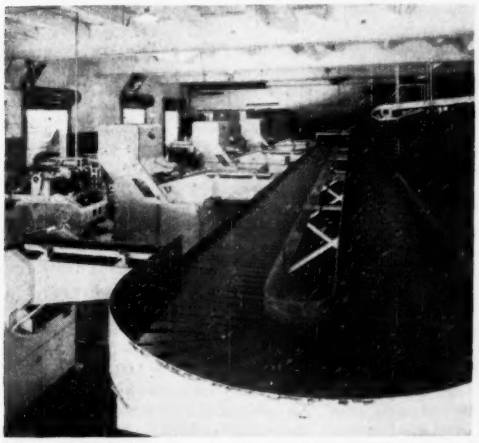
(*Turn to page* 167)



PHOTOELECTRICALLY operated pan transfer feeds the pans from two conveyor lines onto one line leading to second proofer. Efficient layout is specially stressed.

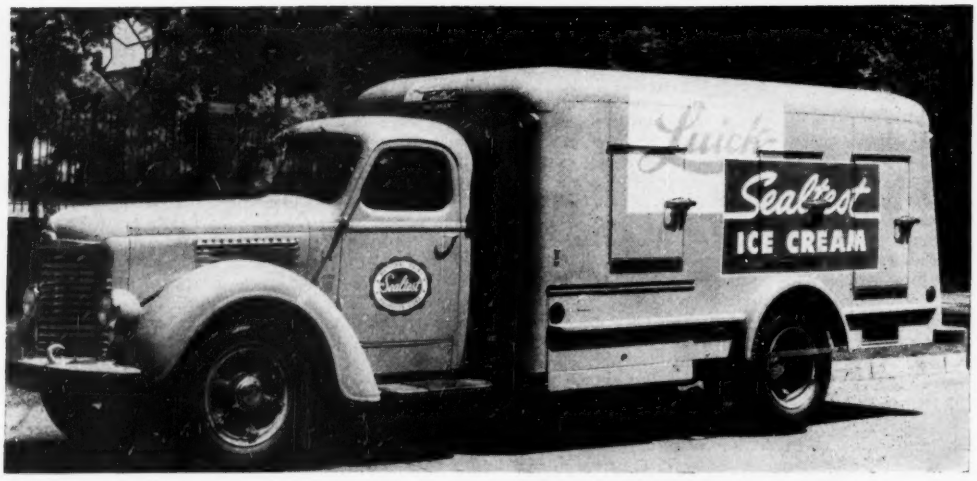


FINAL PROOFER (top) discharges at end of oven (left). Pans are automatically loaded into oven by electric-control hydraulic pusher bar. Proofer over oven saves space.



COOLED BREAD is conveyed onto this "merry-go-round" traveling table, from which it is then manually fed, as needed, into the battery of wrapping machines.

WRAPPED LOAVES go into wooden boxes, which are conveyed to delivery trucks by this double deck conveyor —which also carries empties from trucks to plant.



MOUNTING, under forward door, conforms to the lines of the carrier on this ice cream delivery truck

Truck Speeds Can't Faze New Cooling Unit

Control of hydraulic pump oil flow regulates compressor speeds even though powered from vehicle's engine. Weight is reduced by as much as 1,000 lb.

OPERATED by the truck's (or tractor's) own powerplant, a new refrigeration system manufactured by the Batavia Body Co., Batavia, Ill., for food trucks and trailers uses a hydraulic pump and reduces weight by as much as 1,000 lb.

With other factors remaining constant, this weight saving may be added to the payload capacity of the carrier.

The system, described briefly in July FI (New Equipment, p. 94) overcomes the drawbacks of the great variance in speeds of truck engines where previous systems were driven off the vehicle's powerplant. The hydraulic pump is driven off the idler gear of the truck's gear-set or transmission, providing a by-pass control for the hydraulic pump oil. This keeps the speed of the condensing compressor of the system within predetermined safety limits, regardless of the engine speed or road speed of the truck.

Fewer Parts

To keep the condensing compressor from running too fast when the truck is going 50 mph., and from running too slow when it is idling, the oil by-pass of the new Batavia system requires fewer mechanical parts than previous systems.

In a powerplant-drive system described here two years ago (August 1948 FI), the drive was taken off the truck's propeller shaft by a pulley and belt driving through a speed-reducer. The latter was operated by a multiple-disk clutch controlled through a hydraulic-piston-pump, which in turn was controlled by a solenoid operated by a thermostat inside the truck body. These controls shut off the system when the desired body temperature was reached, but did not eliminate the varying speeds of the compressor in accordance with the truck's road speeds.

Constant Voltage Generator

Still earlier, another method of utilizing the truck's engine to operate the vehicle's cooling system was described (January 1942 FI). Here, a constant-voltage d.c. generator was driven off the truck's gear-set through universal joints to operate a dual a.c.-d.c. motor directly connected to the refrigerator compressor. For stop-over periods when the truck engine and the d.c. constant-voltage generator were not operating, the dual a.c.-d.c. compressor motor was run by any available 110-volt a.c. lighting circuit.

The newest Batavia system includes a plug-in a.c. motor for stop-over periods, but it has no magnetic clutches or constant-voltage generators. It is available in a range of 1 to 3 hp. for high or low temperature for the smallest truck or the largest trailer. It has been under test and development over an 8-year period.

The Batavia system is composed of four-part groupings as follows:

1. The refrigerating equipment consisting of the condensing compressor, heat exchanger, expansion valves and evaporators with the necessary tubing and fittings to make the proper connections
2. The prime power source or gear-set take-off
3. The piston-type hydraulic fluid motor and its reservoir tank, fittings, and valves
4. The control equipment

With this system, the company recommends the use of the plate-type evaporators inside the vehicle body instead of the conventional hold-over plates—because of less weight, a more even distribution of the pick-up surface, and the elimination of the necessity to defrost on every off cycle.

When mounted on a straight truck, all parts of the system are located on the truck frame below the body floor line so as not to reduce the load-carrying body volume and for easy access for adjustment or repairs. But when the system is used on a tractor-trailer combination, the prime power unit and some of the controls are mounted on the tractor, while the refrigerating

unit, the fluid motor, and the rest of the controls are mounted at the most convenient location on the trailer, connecting with the prime power unit by self-sealing hydraulic hoses. These latter are easily disconnected for the electric plug-in operation of the compressor during stop-over periods.

Operation Cycle

The mechanics of driving the refrigerating hydraulic system consists of taking power from the truck's gear-set through a power take-off shaft directly connected through a flexible coupling to two small pumps, mounted on the same shaft and which therefore, turn at the same speed. These two pumps deliver oil through a single line to the fluid motor, causing it to revolve and drive the compressor. After the oil has accomplished its work in the fluid motor, a return line takes it to the oil reservoir, from where it is recirculated through the pumps to repeat the cycle.

With a power take-off system, the need for a positive control of the compressor speed is evident from the fact that most truck engines idle at about 500 rpm and run through a range as high as 3,500 rpm at top speed. In the Batavia system, this control is provided by diverting part of the oil furnished to the fluid motor at the point where the compressor speed begins to become excessive.

Combination Values

This diversion of the oil is accomplished through two combination dumping and relief valves. A valve on one of the dumping valves is activated by a Bendix vacuum cylinder, which in turn is connected through an electric solenoid to the truck manifold.

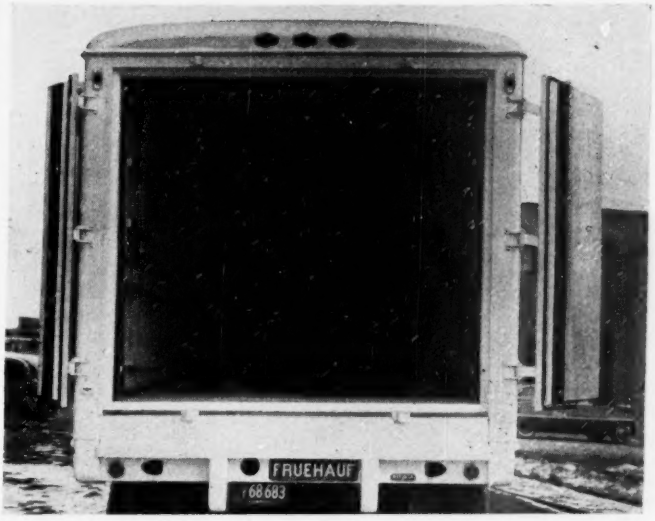
The solenoid is connected to the truck's battery through a microswitch-equipped centrifugal type governor, which is driven off the power take-off shaft and runs at the same speed as the two fluid pumps.

When the truck engine is idling or the truck itself is running at low speeds (up to 25 mph.) the vacuum line through the solenoid to the control valve is open to the engine vacuum, and this maintains a pressure against a control pin in the control valve. The solenoid is always energized at low engine speed.

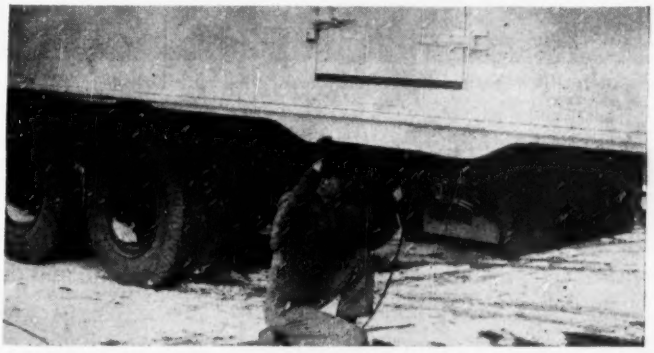
However, when the power take-off shaft attains a speed that is in excess of a road speed of 25 mph., the governor causes the micro-switch to make contact and de-energize the solenoid. When this occurs, the dumping valve opens and diverts some of the oil back to the oil reservoir, thus reducing the amount passing through the fluid motor.

These controls permit the compressor to run between 550 rpm. and 800 rpm. (corresponding to about 25 mph.) at which point the dumping valve operates and drops the compressor speed back to 550 rpm.

The compressor speed is thus limited to a safe range of from 550 to 900 rpm. The control is positive and automatic and beyond the control of the truck driver.



ON TRAILERS, the condensing unit may be mounted where convenient—amidships under the body floor in the case of this heavy-duty unit.



EVAPORATOR PLATES take up very little room on the front and sides of the insulated body on this hydraulically refrigerated trailer.

Gear Shifting

When it is necessary to shift gears while the truck is in motion, it is imperative that the load placed on the transmission gears by the compressor be removed temporarily. Otherwise, it is almost impossible to go through the normal operation of shifting. This is accomplished through almost the same type of control as that used to regulate the compressor speed, except that no governor is involved.

When gears are shifted, the driver depresses a switch in the floor of the cab. This switch is like the light dimmer switch used on all cars and trucks.

Depression of the switch diverts high pressure oil. It goes from one of the hydraulic pumps back into the reserve tank instead of through the fluid motor. This allows the compressor to be at rest during the entire cycle of gear shifting, thereby taking the pressure off the gear-set idler gear. With the shifting completed, the driver again depresses the switch and the compressor starts operating as before.

When mounted on a straight truck, the condensing unit and the hydraulic

(*Turn to page* 164)

VOLUMINOUS FOAMING results from mechanical agitation and dispensing large amounts of air through the medium.

Five Keys to Growing Nutritional Yeast

For A-1 quality product, carefully propagate selected culture on suitable substrate with large amounts of purified air. **Then separate and dry to 3-6 percent moisture**

C. H. KEIPPER

Director, Products Control Laboratory,
Red Star Yeast & Products Co., Milwaukee

There are five major requirements in the production of yeast for nutritional purposes—

1. A sufficient quantity of healthy stock culture with low bacterial count.
2. A suitable substrate for the yeast's growth.
3. Fermentation of the substrate to produce a yeast with desired amounts of protein, minerals and vitamins.
4. Concentration to 15-17 percent cream.
5. Drying, milling, packaging, and storing to insure against loss of quality.

Throughout, there should be close supervision to insure top quality. And, of course, it is important that raw materials be selected with care and that good storage conditions be maintained.

First, hastening to say that present practices are the result of many theories and much experimentation, we will here survey the steps, with close attention to their interrelation, noting as we go the salient references.

A recent general article on yeast by Gontard[1] is of specific interest, since the author brings up to date the development of our present concept of yeast. Fermentation has been the subject of many investigations. One of the more recent surveys by Silcox and Lee[2] is quite conclusive. Surveys on food yeast[3,4,5,6] have contributed much to our present knowledge of the subject.

Our discussion of culture will concern strains of *Saccharomyces cerevisiae*. Naturally we are indebted to early investigators for basic knowledge of yeast. However, little work was accomplished with the yeast cell, as such, until the 20th century. Fundamental investigations, carried on by numerous scientists[7,8,9], resulted in the clarification of our concept of the yeast cell. Today, we are not only able to pick out single cells for cultivation, but actually to mate individual ascospores. These findings have opened up an entirely new field of endeavor and bid fair to be of extreme value in correcting some of our ideas.

It is hoped that the result of the investigations on the genetics of yeast will allow the industry to select and breed for desired characteristics—such as for utilizable substrate, yield, vitamin synthesis, and the like.

In selecting the culture, several factors must be taken into consideration. The strain must: (1) Be capable of maintaining biological uniformity and be adaptable to the proposed substrate; (2) be capable of producing a yeast of desirable characteristics; and (3), have characteristics that will assure easy handling of the propagated yeast.

It is easy to outline the program of the commercial producer in selecting his culture. Numerous pilot plant runs

are made on several strains. The one best suited for growth is selected. Several methods are employed for preservation of the culture. Lyophilization of the cells[10] has proved very practical.

How Culture Is Propagated

When a stock culture is to be placed into the production line, it is grown in liquid media in the laboratory or culture room for two or more transfers. The medium to be used will, with each transfer, more nearly conform to the subtrate used in the plant. Finally, increased inocula are used to seed larger culture flasks and are then transplanted into the pure culture system in the main plant. This system consists of two or more enclosed fermenters equipped for cooling, aeration, and aseptic transfer of their contents to other tanks. Capacity of the entire equipment is comparatively small, probably less than 1,000 gal. Construction is usually of stainless steel. Subsequent transfers are made until a suitable amount of yeast is obtained for a large fermenter, which in turn furnishes the yeast for the final commercial fermenters. Three or more transfers, into larger and larger fermenters, are usually necessary to obtain the desired quantity of yeast for seeding the final fermentation. An elapsed time of 48 to 72 hr. is generally required for this production. Purified air is introduced in ever-increasing amounts as the transfers proceed. The tolerated contamination through the final stage before trade fermentation is low.

Like all living organisms, yeast must have a source of energy and of protein or nitrogen. Due to the simplicity of the yeast cell, as compared to higher plants and animals, the raw materials selected must of necessity be in soluble form. *Saccharomyces cerevisiae* is unable to use the pentose, lactose, raffinose, or higher carbonaceous materials. Thus, the raw materials that are selected, whether they are small grains, final beet, or cane molasses, or even such materials as cotton seed meal, fibrous substances, or animal products, must be so treated as to provide soluble products usable by the cells. It is clearly recognized that such an array presents many interesting possibilities, and a study of the patent file will quickly dispel any doubts as to the simplicity of this problem.

In the brewing and distilling industry, small grains and corn are still used extensively; in fact, until some 20 years ago, much of the yeast sold was of the grain variety. Many articles and patents have appeared on the production of grain yeast prior to 1924, but the practice has been discarded long since for economic reasons. Molasses-grown yeast can match qualities with the grain yeast and is considerably cheaper to produce. A limited amount of yeast grown on a molasses substrate was produced during World War I. However, it was not until 1923, when the first basic patents were granted[11] in this country, that the production of a molasses-grown yeast became general.

Advent of molasses as a raw material encouraged many investigators to study methods of clarification and cover them with a number of patents.[12,13,14]

Substrate Is Classified

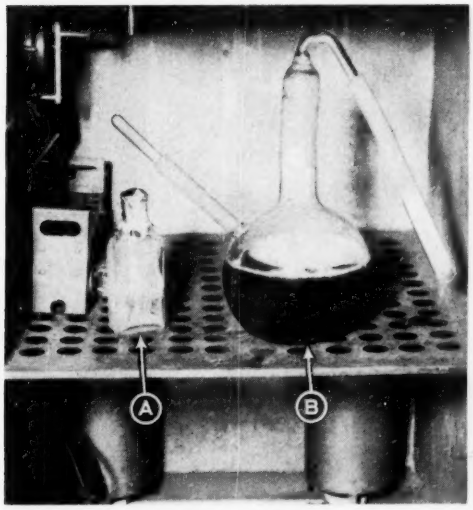
Regardless of the method of preparation or pre-treatment used, the saccharous material is heated nearly to boiling before it is clarified. Although centrifuges have been tried, and their application is sound, filtration is the prevailing practice. There are several types of filters to choose from: Plate and frame, Sweetlands plate, carborundum stone type, and the continuous Oliver. Or some modification of them may be selected. Filter-aid is added to assure clarity. A pre-coat of such filter-aid is placed on the cloth, wire screen, or carborundum stone before the filtration is started. The filter-aid in general use is diatomaceous in character, although infusorial earth (bentonite) and charcoal have been used experimentally.

Sedimentation has been used as such or in connection with some type of filter. This method is slow and expensive and is not in use to any extent.

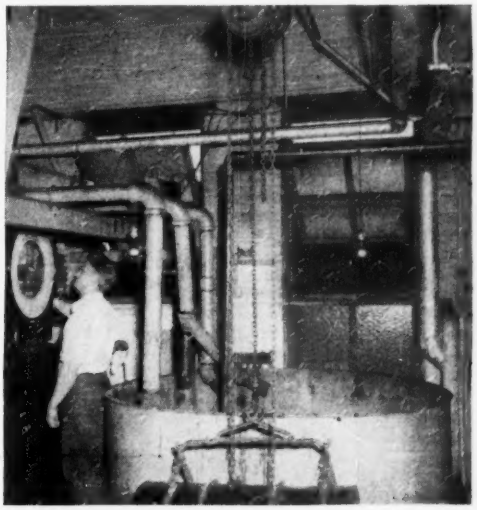
Usual practice in the clarification of molasses is to adjust to a definite pH by the use of lime or acids such as

A Quick Check of the Keys

Turn page



KEY 1. A selected strain of yeast is grown on nutrient agar (A), then transplanted to sterile liquid media (B), and further increased by transfer to enclosed fermenters.



KEY 2. is preparation of a suitable substrate. The saccharous material is clarified by filtration, sterilized by boiling, then carefully weighed into the fermenters.

sulphuric or phosphoric. The final pH for filtering is usually around 4.5 to 5.0 to avoid precipitation later in the fermenter. Directly after clarification, the liquid wort is sterilized by heating nearly to boiling. This may be accomplished with heat exchangers or direct or indirect heating with steam in a tank.

No attempts are made to obtain a well-balanced substrate at this stage. Ammonium salts and other chemicals are put directly into the fermenter as needed. Usual practice in the United States is to employ both beet and cane molasses with or without the addition of such organic nitrogen-carrying substances as malt sprout or corn steepwater. Although hydrol, a corn molasses, has been used in considerable quantities for yeast production, its use will depend largely on price. Hydrol carries about 50 percent sugar, but has very little nitrogenous organic matter or growth-promoting substances. This necessitates use of rather large quantities of other molasses or addition of malt sprouts or corn steepwater. Hydrol is easily handled, and it clarifies and filters very readily.

Some attempts have been made to use the concentrates of fruit wastes, such as grapefruit, oranges, and lemons. The governmental laboratories in Florida have done considerable work with such material. In those countries where cane molasses is in great surplus, food yeast production can be carried on very cheaply, since the bagasse is used as a source of fuel.

For handling the raw materials, storage tanks of steel or concrete, rotary pumps, weighing tanks, mash and holding tanks must be provided. The mash and holding tanks are usually of wood or steel and of sufficient capacity to permit preparation of enough substrate at one time for several fermentations. Mash and holding tanks of 15,000 to 20,000 gal. each are not uncommon.

Yeast Growing

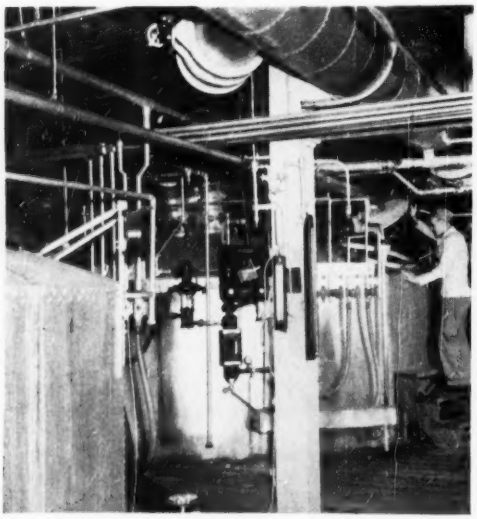
Actual propagation of the yeast follows the clarification and sterilization of the substrate. Problems involved in its growing have much in common with those confronting the producer of yeast for baking purposes. The differentiation arises from the uses for which each is intended. Baker's yeast must contain living cells capable of sustaining a high rate of fermentation, whereas nutritional yeast is inactivated and must be of high nutritional value, especially in vitamin, mineral, and protein content. Nutritional yeast fermentation could be defined as the production of biological and chemical materials usable by the animal or human body.

Commercial yeast for nutritional purposes is grown in large vats or fermenters made of materials that minimize cleaning and corrosion. Stainless steel, steel, copper, wood, and glass-lined steel are in use. Fermenters must have a large amount of cooling surface and aeration apparatus. Due to the large amount of foam encountered, most fermenters are designed for a capacity of over 20,000 gal.

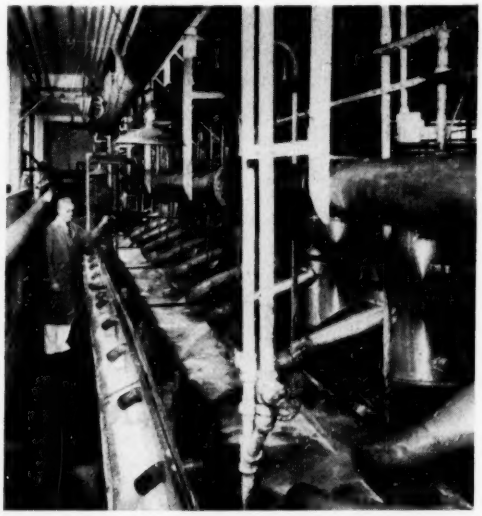
The continuous feeding-in process is usually practiced[15]. This process starts with a small quantity of concentrated substitute or wort, to which is added a large volume of water. The sugar content is reduced to 5 percent or lower, and the starting volume is approximately 2/3 that of the final total. The culture, or stock yeast, is introduced along with appropriate amounts of ammonium and other salts, and the blowing in of the air or mechanical agitation is started. Shortly thereafter, more concentrated substrate is introduced, maintaining the sugar content between 0.1 and 1.0 percent at all times. By such practice and with an adequate supply of air, the alcohol content will not exceed the 0.5-1.0 percent range at the end of fermentation.

Selection of salts is careful and the amounts used are regulated to maintain good growth throughout the fermentation and to finish with a yeast of desired protein and mineral content. Usually, ammonium sulphate and phosphate are both added. As the ammonia is utilized, the sulphate radical is liberated and a drop in pH will be noticed. The pH is usually maintained at 4.3 to 5.2 by addition of ammonium hydroxide or sulphate as needed. Temperature is held as close to 30 deg. C. as is practical, and the dilution at the finish of fermentation is between 20 and 40 gal. per gal. of molasses used. So far as is known, all primary grown yeast in this coun-

Keys continued ⟶



KEY 3. Fermentation is carried out in large tanks provided with extensive cooling surfaces and equipped with special apparatus for fine air dispersion.



KEY 4. Yeast is separated from the fermented liquor and concentrated to a cream of 15-17 percent solids by a battery of 6,000-gph. centrifuges.

try is produced in fermenters equipped with air distribution systems. Likewise, the batch method of withdrawal is common practice.

Numerous patents providing for continuous withdrawal have been granted. This method has a very serious drawback if molasses is used as the main source of sugar. Contaminating microorganisms, many of which will grow nearly as rapidly as the yeast, will eventually foul the fermentation or create such a disturbance, either during fermentation or at the time of concentration, that it is not practical to operate under such a method. However, the continuous withdrawal system has been successfully carried on for many successive days with the use of other substrates, and could be carried on even with molasses if aseptic fermentations were maintained.

The amount of stock yeast used in the fermenter is normally about 1/6 the total yeast to be produced. If intermediary steps are used between the stock and the final commercial fermenter, this amount will be decidedly lower, and it may be as low as 1/12 of the final yeast produced.

Fine Air Dispersion Best

The problem of aeration is an intricate one and can be more fully appreciated after reading one or more of the excellent surveys on the subject[16]. There have been many patents granted on the dispersion of air through the fermenting medium. The theory of very fine dispersion and the phenomenom of rotation of the fermenting liquid to increase the distribution of the small air bubbles originated from work on porous materials[17]. The idea of the branching perforated tube was encouraged by some of the early manufacturers[18] and is still practiced widely. More recent developments include the Vogelbusch[19] fermenter, which provides for dispersing the air through very small apertures by a rotary fan arrangement. Another method[20] controls the quantity of air to the fermenters by impulses and pressures.

Probably the most recent development is the Waldhof fermenter[21], which contains a central draft tube. Here, the air enters through revolving aerators below the tube and rises through the medium on the outside of the tube. Foam is sucked down the tube and recirculated. Claim is made that no defoamer is required and less air is needed. Some of the drawbacks to this type of fermenter are the cost of installation and the difficulty in cleaning, as well as the added power required for the rotary fan.

Whether the air is distributed through perforated tubes or porous substances, the consensus still favors the fine air distribution. Porous substances used, such as carborundum tubes or plates, present some disadvantages that have not yet been overcome. Difficulty of efficient cleaning and sterilizing, plus a limited amount of breakage, have made these types of aerators quite unsatisfactory. Still another serious drawback is that the savings in air volume are dissipated, if the energy spent in forcing the air through the plates is taken into consideration.

The amount of air or agitation required has been the subject of several articles[22,23]. It is agreed that effective aeration depends on a number of factors, such as: Amount of air, fineness of dispersion, rate of agitation, size of fermenter, and volume of the medium. The volume of air may be expressed as (1) liters per gram of yeast produced, (2) liters per liter of medium per min., or (3) cu. ft. per min. per lb. of yeast produced. Most commercial plants' air volume figures are given as cu. ft. min. per fermenter. Such volumes as 3,000 to 6,000 cu. ft. min. per fermenter during the active growing period are quoted. The air pressure used should be as low as is practical, with 6 to 9 lb. about the average.

Regardless of the method of aeration, or amount used, the air must be sterile during the course of fermentation. Sterile air has been produced by passing it through columns packed with cotton, carbon, glass wool, or metal shavings soaked with oil; by the use of ultraviolet light; by scrubbing with caustic or sulphuric acid; by heat or disinfectant solutions; and even by subjecting the air to electronic precipitation.

Length of fermentation time is quite variable—usually 10 and 14 hr. Rate of fermentation is affected by aeration, agitation, physical properties of the substrate, temperature, and the strain of yeast. A better understanding of the effects of these various factors is needed. This study should bring about more efficient designs for fermenters and improved fermentation procedures.

Increasing Vitamin Content

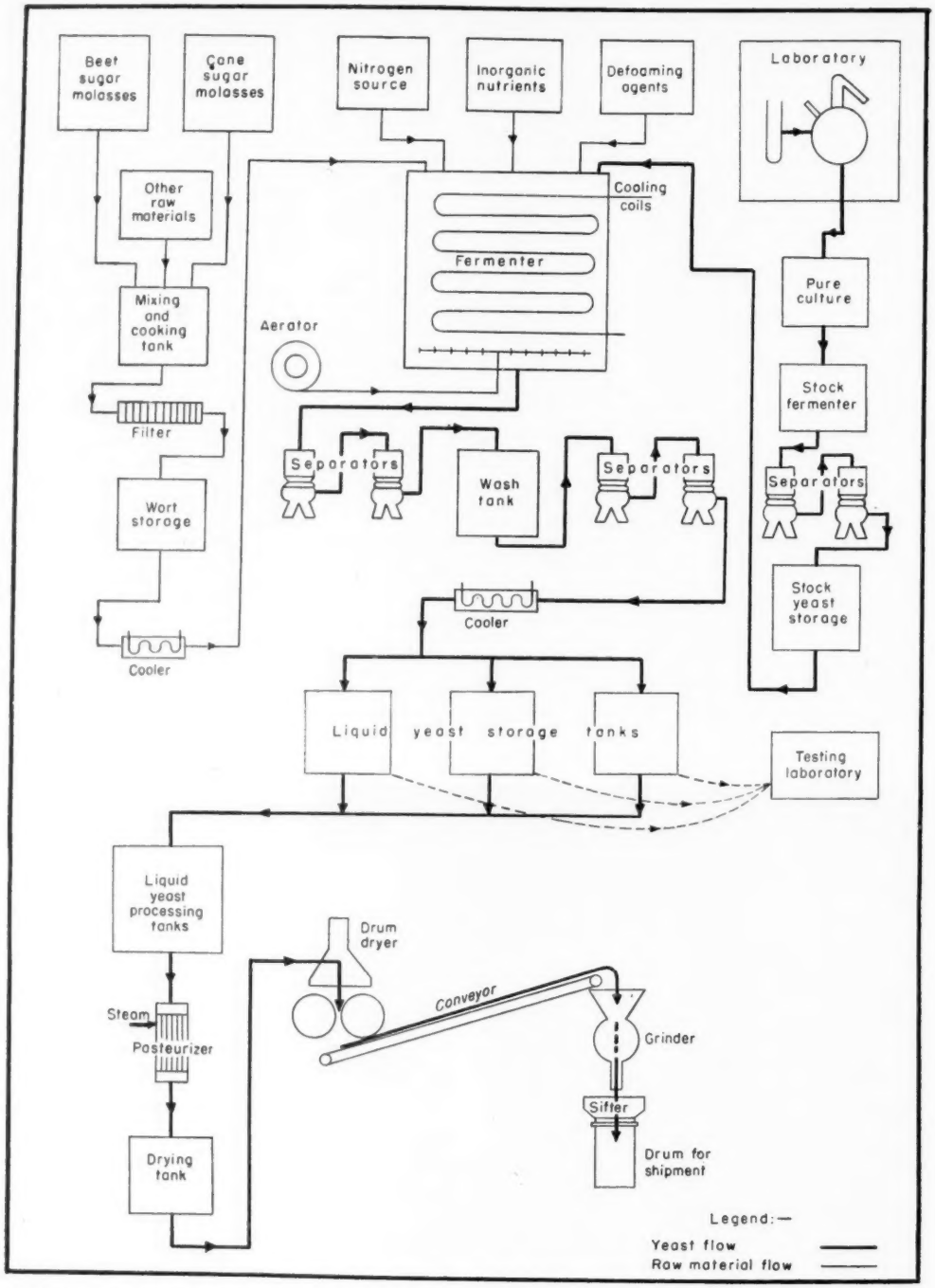
Besides the carbohydrate-protein substrate, and the organic nitrogen and phosphate-bearing salts, other chemicals are often needed. A good nutritional yeast is one high in protein and minerals (easily calculated and fed in as previously stated) and vitamins.

Vitamin content can be regulated, and in some cases is greatly increased. Many patents and reports have dealt with the synthesis of the various B-complex vitamins by yeasts. It is fairly well-known that thiazole and pyrimidine derivatives[24,25], as well as crystalline thiamin chloride, can be taken up in large quantity by the growing yeast cells. Likewise, nicotinic acid is readily absorbed by the fermenting yeast, resulting in a product containing much more nicotinic acid than does the usual yeast.

Riboflavin, pantothenic acid, pyri-

KEY 5. is roll drying to 3-6 percent moisture content and packing in vapor-resistant, air-tight containers to protect the yeast from moisture, odors, and deterioration in flavor.

How Nutritional Yeast is Grown



LABORATORY cultures are transplanted into the pure culture system of the plant, then to the clarified, fortified substrate in fermenters. When fermentation is completed, yeast is separated from liquor, dried and packaged.

doxine and biotin are not as readily taken up or synthesized. However, all can be increased considerably by careful selection of the strain and substrate, as well as by special fermentations and pre-treatment of the concentrated yeast before drying. Maizel[28] reports that the content of thiamin and riboflavin can be doubled in the yeast cell by holding the yeast cream at 32 to 37 deg. F. for several days. The ergosterol content can also be increased by the use of oxidizing agents[27], by cultural conditions[28], and by aeration[29].

Thus, the production of nutritional yeast with relatively large percentages of most of the B-complex vitamin, as well as ergosterol, is a reality. It is undoubtedly true that not all the practices of the trade on vitamin concentrations have been published. Here, many a company resorts to high secrecy.

During the fermentation, a large volume of foam is produced by action of the air and the nature of the substrate. With grain or molasses fermentations, the foam can be held down rather economically by use of surface tension agents. Animal and vegetable fat is used to a large extent. Such material may or may not be sulphonated (either by the manufacturer or by the user). With sulphite waste liquors, the problem of foaming is many times more troublesome, and other devices, or defoaming agents, have come into use. The Waldhof fermenter[30] was invented especially for use in producing yeast from sulphite waste liquor. Defoaming agents, such as hexadecanol or tetradecanol with equal parts of paraffin oil, have been used. Dodecanol also has been found to be of great aid in some of the tenacious-foam producing fermentations[31].

Separating and Drying

Yield of dry yeast per total pounds of material used will depend on many factors. It should be about 25 percent. This means efficient separation of the yeast from the fermented liquid. The special yeast separators are of the conical variety, capable of handling as much as 6,000 gal. per hr., and are usually constructed of stainless steel. Yeast is commonly concentrated to 15 to 17 percent solids, after which it is cooled and held for drying, or else started through the drying equipment immediately. Most separators are not continuous or self-cleaning, although some yeast producers may use such equipment.

The cream or concentrated yeast is placed in processing tank, then moves through some type of preheater and finally goes to the dryer. Vacuum drying has been tried and gives a very fine product, but vacuum dryers are expensive to construct and maintain. Spray drying is a practical method, and the equipment is relatively easy to maintain. It does take a large amount of room for the chamber and cone, however, and has an additional disadvantage in that only powered yeast can be produced, whereas flake yeast might be preferable in some cases. Most of the nutritional yeast is dried on a rotary drum dryer of some type. The equipment and operational set-up is practical, and a large amount can be dried to 3 to 6 percent moisture at a nominal cost.

After leaving the dryer, the yeast may be ground to a very fine powder on a hammer mill, or the small flakes may be used, as such. Dried yeast must be packed in moisture-proof containers of either heavy paper or metal—i.e., of such material that the yeast after prolonged storage will not take on moisture, off-odors, or flavors. Storage should be in a dry, cool place to avoid loss of nutritional value.

Since increasing interchange of ideas is foreseen, this discussion would not be complete without a short review of the nutritional yeast picture in other countries.

During World War I, Germany produced a small amount of nutritional yeast. Such strides were made during the intervening years that at the beginning of World War II several plants were already in production[32]. The yeast was all propagated on sulphite liquor or wood hydrolysates. *Torula utilis* is apparently the organism used most frequently in the utilization of this waste material. The principle reason for the change from *Saccharomyces cerevisiae* lies in the much higher production by the Torula, Candida, and others that have the ability to use the hexoses, pentoses, acetic acid, and similar organic materials more efficiently.

The English have set up a plant in Jamaica using *Torula utilis* with molasses as the substrate. This plant claims to be operating at a profit and is capable of producing a substantial quantity of yeast[33]. Sweden also is producing this type of yeast[34].

This same type of organism is being used in a limited way at present in one or two plants in the United States. Such yeast is going into feed and is of good quality. The U. S. Forest Products Laboratory has developed a modification of the Scholler process, which operated so successfully in Germany on wood sugars. This is known as the Madison Wood Sugar Process[35]. A plant using it is now in operation at Springfield, Ore.

References

1. Gontard, A. V., *Dried Yeasts and Their Derivatives*, Anheuser-Busch publication, Vol. I, July, 1948.
2. Silcox, H. E., and Lee, S. B., "Fermentation," *Ind. Eng. Chem.*, 40, 1602, 1948.
3. Boruff, C. S., and Van Lanen, J. M., "The Fermentation Industry During World War II," *Ind. Eng. Chem.*, 39, 934, 1947.
4. Harris, E. E., Hannan, M. L., Marquardt, R. R., and Bubl, J. L., "Fermentation of Wood Hydrolyzates by *Torula utilis*," *Ind. Eng. Chem.*, 40, 1216, 1948.
5. Stubbs, J. J., Noble, W. M., and Lewis, J. C., "Fruit Juices Yield Food Yeast," Food Ind., 16, 68, 1944.
6. Thaysen, A. C., "Production of Food Yeast," *Nature*, 14, 116, 1945.
7. Winge, O., and Laustsen, O., Compt. rendu trav. Lab. Carlsberg, *Ser. Physiol.*, 22, 337, 1939.
8. Kruis, K., and Satava, J., O vyoji a dliceni spor jakoz sexualtie kvasinek, *Nakl. C.*, Akad. Praha, 1918.
9. Lindegren, C., "The Improvement of Industrial Yeasts by Selection and Hybridization," *Wallerstein Lab. Comm.*, Vol. VII, 22, 153-68, 1944.
10. Wickerham, L. J., and Andreasen, A., *Wall. Lab. Comm.*, Vol. V, No. 6, 165, 1942.
11. Haydruck, F., *Process for the Manufacture of Compressed Yeast and the Product*, U. S. Patents 1,449,102, 1,449,-103, 1,449,104, 1923.
12. Hoffman, C., Frey, C. N., and Hildebrandt, F. M., *Method of Clarifying Cane Molasses for the Growing of Yeast*, U. S. Patent 1,687,561, 1928.
13. Ronsohoff, F., *Treating Molasses*, U. S. Patent 1,688,831, 1928.
14. Kusserow, R., *Process of Cleaning Molasses for Manufacturing Compressed Yeast*, U. S. Patent 1,642,929, 1927.
15. Haydruck, F., U. S. Patents 1,449,-105, 1,449,106, 1,449,110, 1923.
16. de Becze, G., and Liebmann, A. J., "Aeration in the Production of Compressed Yeast," *Ind. Eng. Chem.*, 36, 882, 1944.
17. Stich, E., *Process and Appliance For Fermenting Sacchariferous Liquids*, U. S. Patent 1,792,450, 1931.
18. Strauch and Schmidt, German Patent 552,241, 1932, *Ind. Eng. Chem.*, 36, 882, 1944.
19. Vogelbusch, W., *Special Method of Aerating*, U. S. Patent 2,121,458, 1938.
20. Rosenquist, O., *Aeration of Fermenting Wort in the Manufacture of Yeast*, U. S. Patent 2,281,457, 1942.
21. Saeman, J. F., Locke, E. G., and Dickermann, G. K., FIAT Final Rept. 499, 117, (Joint Intelligence Objectives Agency, Washington, D. C.), 1945.
22. Singh, K., Agarwal, P. N., and Peterson, W. H., "The Influence of Aeration and Agitation on the Yield Protein and Vitamin Content of Food Yeasts," *Archives of Biochem.*, 18, No. 1, 181-92, 1948.
23. Pavcek, P. L., Peterson, W. H., and Elvehjem, C. A., *Ind. Eng. Chem.*, 29, 536, 1937.
24. Schultz, A. S., Atkins, L., and Frey, C. N., *Synthesis of Thiamin and Product*, U. S. Patent 2,262,735, 1941.
25. Harrison, H., *Culture of Yeast*, U. S. Patent 2,359,521, 1944.
26. Maisel, B., *Treatment of Yeast to Enhance Vitamin Potency Therof*, U. S. Patent 2,411,445, 1946.
27. Bennett, W. G., *Manufacture of Yeast*, U. S. Patent 2,059,980, 1936.
28. Bennett, W. G., *Manufacture of Yeast and Other Like Microorganisms*, U. S. Patent 2,276,710, 1942.
29. Ramaswamy, S., and Sreenivasaya, M., "Cultural Conditions Influencing the Ergosterol Content of Yeasts," *J. Sci. Ind. Res.* (India) 5B, 51, 1946.
30. Saeman, J. F., Locke, E. G., and Dickermann, G. K., FIAT Final Rept., 499, 117, 1945, (Joint Intelligence Objection Agency, Washington, D. C.)
31. Stelbelt, W., *Composition for Combating Foam*, U. S. Patent 2,085,709, 1937.
32. Saeman, J. F., Locke, E. G., and Dickermann, G. K., FIAT Final Rept. 499, 117, 1945.
33. Flora, M. B., Flock, W. A., and Collier, J. S., "Food Yeast, Some Aspects of Its Development and Production," *Proc. Brit. West Indies Sugar Tech.*, 13, 38, 1947.
34. Rosenquist, O., "How Sweden Produces Yeast for Nutritional Purposes," Food Ind., 16, 443, 1944.
35. Harris, E. E., and Beglinger, E., "Madison Wood Sugar Process," *Ind. Eng. Chem.*, 38, 890, 1946.

NOVEL suction feeder is used to supply plates to conveyorized plate holders going to dough-rolling machines.

ALSO DEVISED were special runners (background) over which plate-rims glide, neatly putting pies on belt to oven.

Down Go Pie-Plate Handling Costs

St. Louis baker saves on man-hours and materials, also adds new eye-appeal and quality to his pastries—by switching to expendable foil plates

THROUGH the use of inexpensive, expendable, aluminum pie plates, considerable savings in labor and materials, and also notable improvements in the quality and appearance of pastries, have been attained at the plant of Walter Freund Co., St. Louis. The bakery makes 4-in. tart-size pies, also 8-in. pies.

Man-hours are now saved in three operations — pan-washing, make-up, and packaging. By adopting the new foil plates, pan-washing has been entirely eliminated, and so has the job of nesting the pie tins for delivery to the production line. Feeding pie plates to the two make-up machines has been simplified. Formerly, tin plates were supplied by hand, but now a special suction device is used to feed four of the 4-inchers at a time. And another job that had been done away with is transferring of pies from baking tins to paper pie plates.

Accordingly, paper plates are no longer required, the pies being baked and sold in the same foil plates. And the need for other materials, too, has been precluded—water and detergents being no longer essential, since the foil plates are not re-used.

Pies are now given additional taste appeal, through use of a thinner crust, made possible by the new method. Fact was that the old system had required the thicker crust in order to avoid breakage during the now-discontinued tin-to-paper transfers.

Appearance of the pies has been enhanced. They have better eye-appeal because of the exposed silver-colored foil rim. And since the foil plates do not absorb shortening, there is no unsightly fat-staining, common with the cardboard trays.

Changes on Production Line

But before the new plates could be used, it was necessary to make several simple adjustments on the make-up line to compensate for the thinner, lighter foil plates.

One modification was made on the two runners over which the rims of the plates glide as the pies are transferred to the chain-belt conveyor feeding the pies to the oven. Another change had to be made in the meshing of the die that presses top and bottom crusts together to form the 4-in. pie.

The ingenious method now used for feeding the 4-in. foil plates to the make-up machines involves a special plate feeding device. Here, suction is employed to pick up four plates that are then placed in plate holders and conveyed past two dough-crust rolling machines and the filling station. The feeder consists of a vacuum hose with a trigger-controlled pistol grip. The latter is attached to a short length of pipe, which in turn is connected to four short pick-up nozzles. Plates are freed from the device by releasing the trigger to shut off the vacuum.

While this feeding device is now operated by one girl, soon a completely automatic plate-feeding system will be installed.

Numerous experiments were made by Reynolds Metals Co. before a suitable foil plate—0.003 gage and half-hard temper—was finally developed. Current cost of the 4-in. foil plates is well under $4.00 per 1,000.

In addition, the company is finding foil trays excellent for Brown 'n Serve rolls. Here again, many savings are obtained, since the rolls are packed in the aluminum foil tray and merely need the application of a paper band label and cellophane overwrap. And the customers like the trays because the rolls go right into the oven without having to be handled or transferred to another pan.

We Think . . .

■ Doubtful If Processors Will Benefit From Can Company Decision

It's a little too soon to evaluate the food processor's interest in the recent decision of the U. S. District Court of Northern California in the antitrust suit of the Department of Justice vs. American Can Co. and Continental Can Co. Obviously, this is one more attack on bigness. Size, rather than deeds, seems to have been the principal target of the attack.

The court decisions are said to require that the defendants send a copy to every customer. So it appears likely that all who purchase cans from either Continental or American will have received their copies, together with interpretations, long before these comments may be read.

But it will take time to decide whether the food processor will benefit by the antitrust suit. Neither can manufacturer, at the time of writing, had evolved a policy on such a matter as service charges for closing machines sold to a buyer of cans from a different concern. Nor can anyone be sure that canners actually will want to buy the machines at all. As long as title to the machines is vested in a can supplier, obsolescence must be absorbed by that company. Why should anyone want to tie up his money by owning a machine he could rent at a reasonable figure?

A guess at the moment may be premature, but the idea persists that the only beneficiaries, if any, will be the small can companies. And small can companies can't supply big canners. Yet, since one year sales contracts will now prevail for the next five years—in place of longer term sales contracts (usually three years)—both small and large can manufacturers will need to augment sales forces for an annual scramble for business. But doubling the sales force for every manufacture won't reduce costs—nor can prices.

In view of the host of conjectures as to possible eventualities, we believe that some time must elapse before the true pattern of the future will emerge.

■ Margarine—From Idea by Napoleon III to Billion-Pound Hope

1950 will go down in margarine history as the time when yellow margarine was emancipated, the price cut as much as 25 percent, new packages developed, and campaigns launched to push sales to a hoped-for billion pounds for the year.

This year has also seen the opening of an ultramodern new Lever plant at Hammond, Ind., which will produce 13,000 lb. an hour with an improved process and revised formula. The process is said to be the only one in the U. S. in which ingredients are sealed throughout the operation. It also has one or two secret innovations important to product quality. Based upon the Dutch formula, and improved in a 12-year, million dollar product and process research program, the secret formula contains more milk, more cottonseed oil, and less soybean oil.

With the dawning of a new era for margarine, it is interesting to look back to its origin. Taking a leaf from the canned food book of his famous uncle, Napoleon III in 1869 offered a prize for a butter-like product which would resist rancidity. Such a product was needed by the French navy.

A shy French chemist, Hippolyte Mège-Mouries accepted the challenge. He developed a margarin (French for imitation butter) formula in which he used beef fat (oleo), having concluded from studies that cows used their body fat to produce butter fat. The Frenchman never successfully manufactured oleomargarine, but a couple of Dutch merchants—brothers Jan and Henri Jurgens—heard about it and bought the formula. They went into production, and their exports zoomed to 100,000 metric tons in 1900. Then margarine factories sprang up throughout the world.

Later, Jurgens combined with two other European manufacturers to form Unilever N. V. and Unilever, Ltd., which reputedly have become the world's largest margarine manufacturers. Meanwhile, a tremendous amount of technology has gone into improving the product and the process.

Incidentally it should be called "margarine," since beef fat has been replaced by vegetable fats.

■ Progress in Low-Temperature Transportation—But Not Enough

Need for more refrigerator cars which will hold zero temperatures was pointed out a few months ago in this department. Since then, further information has come to our attention which accentuates that need, particularly for long-haul frozen concentrated citrus juices and frozen fish. At the same time, credit must be given where credit is due for work done in improving the performance of refrigerator cars.

Through research by the Fresh Fruit & Vegetable Association, the U. S. Department of Agriculture, and refrigerator car builders, we have today refrigerator cars with built-in fans, 3½ to 4 in. of insulation, and bunkers that will hold 11,000 lb. of ice and maintain temperatures of 10 to 15 deg. with heavy salting of the ice.

There also are available a few dry ice refrigerator cars which will hold low temperatures. And more of these undoubtedly would be built if the frozen food industry demands them. There are a few cars with mechanical refrigeration, as well as some ice-and-salt cars with 6-in. insulation that maintain reasonably safe temperatures if the haul is not too long.

But if the industry is to have the low-temperature railroad shipping facilities that it needs to protect quality, it may have to pay a little more and also turn the cars around more quickly to increase their utilization. There is a lot of room for improvement in the latter direction.

Cars with mechanical refrigeration, of course, offer a solution to the low-temperature problem. But one finds some opposition to their use. It is argued that the possibility of refrigeration failure in transit, with consequent damage to the load, is too great. This may be a legitimate criticism, but it is not a sound basis for stopping the development of mechanically refrigerated cars. In the first place, the equipment has reached such a degree of

perfection that the frequency of failure is low. Secondly, if a car has 6 in. of insulation, temperatures will not rise suddenly. Then it is not impossible to arrange for emergency repair or replacement of a refrigeration unit, nor even unreasonable to have a service man aboard trains hauling refrigerated cars.

The need for low-temperature cars is real, and is steadily increasing. Much of the frozen food output must be shipped in standard refrigerated rail cars for long distances. And this is a defective link in the chain of frozen food processing and distribution operations. What good does it do to quick-freeze products, store them at sub-zero at the plant, and provide low-temperature warehousing at the distribution center if the foods are to warm up in transit? Once the temperature of cases of frozen foods rises, it takes weeks for the product to reach zero again in the warehouse. And cases inside a stack in a warehouse probably will remain at the temperature at which they are stored for months.

Any frozen food technologist can tell you what this does to quality.

▪ Diets, Birth-Rates and Wars Seem Parts of a Whole

If Prof. A. J. Carlson's experiments on animals reveal a universal biological truth, it is possible that diet and nutrition may have more to do with peace among men than has heretofore been regarded even as a theoretical possibility. It is generally true that well-fed peoples are not hostile or aggressive. But the big unanswered question is: How can over-populated areas be well fed? A very large school of thought regards population pressure as the principal cause of wars.

The recent Carlson pronouncement may not suggest the answer. Indeed, it may complicate the problem still further. But at least it suggests a better understanding of underlying causes. Prof. Carlson has found that animals fed on rich and adequate diets have lower fecundity than animals that exist on rough and inadequate diets. In other words, the better their food, the less they reproduce.

This finding has been translated into human affairs as explaining the very high birth rate and over-population of areas like India and China, where malnutrition and hunger are commonplace and life is a short and bitter struggle.

Extrapolations of these basic ideas do not, however, lead to the conclusion that proper national diets will solve all of the problems of war. But they do suggest that certain predisposing factors have been identified, and that in international affairs it may be more blessed to give than to receive.

Incidentally, Russia's proportion of productive agricultural land is so small that experts predict she can never equal present U. S. food output, though she has 50,000,000 more people to feed. If we tie this to Prof. Carlson's theory, we see a long-term higher birth rate in Russia than in this country—and perhaps a growing pressure to fight her way westward to greater food supplies.

▪ Cheap High-Protein Baby Foods Needed to Broaden Market

In 15 years, annual production of baby foods has expanded thirty-fold. Two demand forces actuated this rising supply: First, the population increase. Second, and more important, the sales effort of the industry in intensifying the demand for its products.

But the baby population is declining. It is estimated at 4,700,000 in 1955, compared to 7,400,000 in 1948. So the industry must take every advantage of the second demand force. This includes not only aiming at acceptance of canned baby foods by a higher proportion of young mothers, but also increasing acceptance among elderly persons and those requiring special diets.

To appeal to the shrinking budget and the increasing nutritional knowledge of the average modern mother, inexpensive high-protein foods will have to be added to the canned baby food line. Fish—cheap, plentiful and highly nutritious—is the logical answer to such a need. Already on the market is such a product made from tuna. But why not use the cheaper and even more easily digested sole, halibut, and other bottom fish that last year became a drug on the market?

To appeal to adult tastes and requirements, different formulas embodying less bland flavor and drier texture will have to be worked out. But with the population of elderly people increasing faster than that of any other age group, the potential market should justify the expenditure.

At first glance, dietary packs are more limited as to market possibilities than foods for the aged or for infants. Actually, however, their possibilities cover all age groups. Consider the Van Camp dietary tuna pack. It contains no salt and only 1 percent oil compared to 11 percent in regular canned tuna. So it will appeal to the multitude of consumers who like to keep trim figures, as well as those whose gall bladders are beginning to evidence overwork. High on the "verboten" list of non-fat diets is canned fish. With the clearing of that obstacle, the industry should note a marked increase in sales.

▪ Pepper Not Needed?—Tell It to the Marines

Pepper is not essential, says the Munitions Board, quoting studies of the QM Food & Container Institute for the Armed Forces as follows:

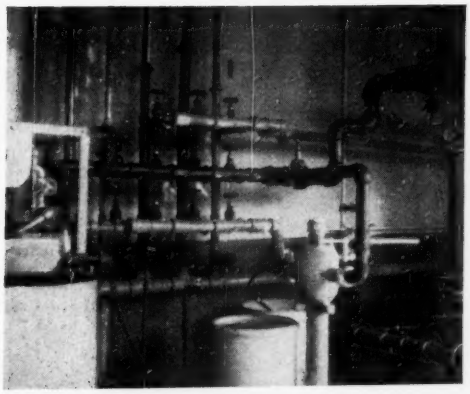
"While pepper is a customary and desirable seasoning, it has no preservative properties and is not absolutely essential in an emergency."

How true! One wonders, however, if those who have decided against stockpiling have ever lived in a pepperless land, or consumed Australian pepperless mutton sausage in World War II, or know history?

The quest for spices, especially pepper, and the hijacking of spice caravans from the Far East, are the forces that led Columbus to seek the Western Route to the Spice Islands. Hijackers of the prohibition era were mild-mannered gents compared to those of the pre-Columbus days. People definitely want spices and they will go to very long lengths to get them.

If, as, and when World War III breaks out, let us hear no more about pepper not being necessary. For if pepper is not essential to morale, then nothing is—not even coffee, tea, carbonated beverages, comic magazines, esthetic dancing—nuthin'.

PRACTICAL IDEAS



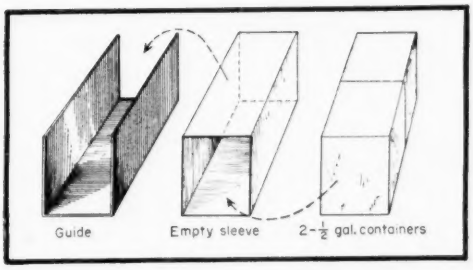
Provides Central Water-Flow Control

This "water-switchboard" effects central control for the distribution of various waters. It is employed in a Venezulan bottling plant.

Installed during the past year, the hookup governs the flow of five types of differently treated water from horizontal "bus-bars" to the vertical "risers," each feeding a different machine circuit.

All pipes are coded in color, and the entire water-system of the plant, including all by-passing and emergency piping, is controlled by the switchboard operator.

Seen at the left in the photo is a demineralizer. In the center is a chlorinator, used for sodium-hexametaphosphate. And at the extreme right is one of a battery of stone filters.—*Robert G. Marny, Consulting Engineer, Caracas, Venezuela.*



Guide Makes Packaging Fast and Easy

Through use of a metal guide box, the task of placing two ½-gal. containers of ice cream into a cardboard-sleeve packaging unit is simplified and speeded at Breyer Ice Cream Co. plant in Philadelphia. Here are details of the development.

The ice cream goes to the retailer on a gallon basis. To handle the two ½-gal containers as a unit, the company uses the collapsible sleeve. It not only facilitates delivery but also is advantageous in the hardening room. For, being open at both ends it permits faster freezing.

The metal guide is a U-shaped box that holds the sleeve in the open position while the operator pushes in the containers of ice cream. Next, the operator pushes the filled sleeve to a tying machine operator. Here, one strand of string is automatically tied around the sleeve. Then this operator places the tied package on a conveyor for delivery to the hardening room.

$25 EXTRA FOR BEST ITEM

You are invited to submit Practical Ideals. You will be paid at regular rates when your item is printed and if it is judged best for the month you will get additional pay of $25.

Selection of the best contributed item will be made by a group of 200 readers each month, and the item title and author's name will be cited (see below).

Practical Ideas may describe any type of device or method recently developed to solve a problem, speed an operation, or make some task easier. They may concern factory, laboratory, warehouse, or power-plant operations in the food industry. Ideas on management, maintenance, and trucking or shipping also are suitable.

You need not be an experienced writer or draftsman to submit these ideas. The text will be edited and sketches converted to finished drawings.

Send your items to: Practical Ideas Editor, FOOD INDUSTRIES, 330 W. 42nd St., New York 18, N. Y.

JUNE PRACTICAL IDEA voted best was "How to Separate Liquids Continuously." It was submitted by P. A. Williams, The W. & F. Manufacturing Co., Inc., Buffalo, N. Y.

Let Enzymes Help You Clean

Employed in a water solution, enzymes capable of dissolving both the protein and fat portions of meat have proved highly satisfactory for cleaning meat processing equipment.

This is important because the usual methods of cleansing have not been entirely satisfactory when applied to the more intricate meat processing machinery. It is well known that meat particles are difficult to remove from grinders, steak cubers, and similar apparatus.

Hot water with soap or other conventional detergents are ineffective because this treatment denatures the protein of the meat and causes the particles to stick to the metal surfaces. More successful approaches to this problem involve attempts to wash equipment with a cold water spray, to force the particles loose, then follow with hot water and detergent to melt and emulsify the fat.

Research done at the Department of Biochemistry, University of Minnesota, shows greater success in using enzymes to digest the meat. The mixture commercially named "Pancreatin" contains digestive enzymes capable of dissolving both the protein and fat portions of meat.

The method used is to submerge the dismantled apparatus in a water solution containing approximately 7g. (¼ oz.) of Pancreatin per gal. After a time interval of an hour, the apparatus is removed.

The enzyme will have carried out digestion of the meat particles and the equipment will need no further treatment except an after-rinse with hot water. Since

Pancreatin is most active at the conditions of pH 9 and a temperature of 98 deg. F., it is suggested that the digestion be carried out in luke warm water (body temperature) containing a buffer.

We use 10 ml. per gal. of a mixture of 53.5g. ammonium chloride and 67.5 ml. of (28 percent NH_3) ammonium hydroxide.—*Aloys L. Tappel, Dept. of Biochemistry, University of Minnesota, St. Paul.*

Ascorbic Way to Keep Meat Bloom

Application of ascorbic acid to preserve the bloom of fresh cut meats is easy and low in cost. And sales of prepackaged meats are benefitted by this treatment.

Just add 1 teaspoonful of ascorbic acid to 2 qt. of cold water and you will have the correct amount of acid needed in the required solution. To apply, dip the meat in a pan of this liquid, let it drain, then package. This solution should be made daily and in small quantities.

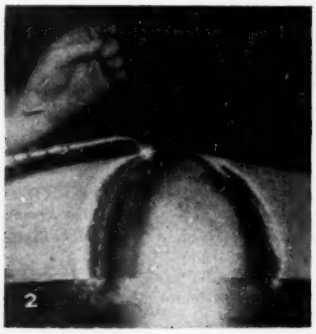
When using this acid it should be specified that the Vitamin C has been added for preservation of color.

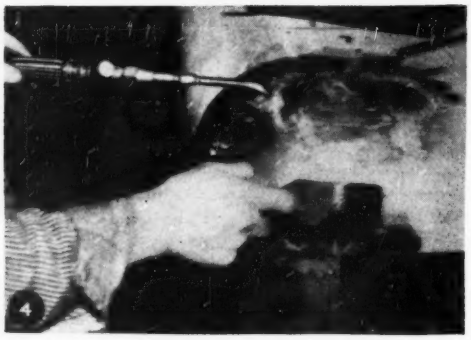
Ascorbic acid protects the product from the air and also acts as an inhibitor for some bacteria. No change in taste is caused by the dip.

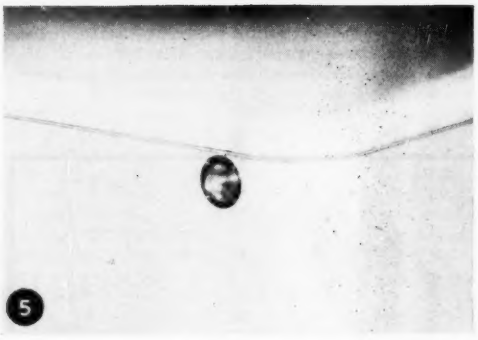
It is important to keep the meat under refrigeration, away from bright lights, and to wrap soon after it is dipped and drained.

Color is a very important factor in prepackaged meats. And the relative effectiveness of ascorbic acid in retarding rancidity of meats has been found to be most useful.

Darkening of meat is caused chiefly by the oxygen in the air and in the product. However this is not the only cause. Light, refrigeration, or the way the animal was slaughtered all have their effects on the color of the meat.—*E. M. Comiskey, Box* 51, *Alfred, N. Y.*







Make Your Welds "Disappear"

Appearance is improved and cleaning operations simplified on welded food equipment and accessories—by having the welds "disappear".

The photos above (illustrating a job on an all-steel truck body) show how you can apply this welding technic in building a housing for a piece of food equipment, or a small tank, chute, flume, or any similar steel unit in the plant.

The secret of making these welds invisible is application of solder in oxy-acetylene welding. One caution, however—do not use solders containing lead on food contact surfaces. Use block tin solder for these parts.

Here's how the job is done quickly and efficiently: In the representative operation illustrated (see Fig. 1) the work consists of welding a sheet metal corner section to a body panel. A small neutral flame is used, where the sheets overlap, to make the weld by melting the edges.

A steel welding rod is used (Fig. 2). After an inch or two of the weld is completed, the weld metal is hammered and depressed to receive the body solder.

Weld areas (Fig. 3) are then ground and painted with muriatic acid cut with zinc, and the cleaned surfaces are tinned with body solder. Following tinning, body solder is again applied.

For all soldering operations, the flame is long and bushy with a heavy excess of acetylene. The solder is kept mushy (Fig. 4) so that it can be smoothed readily with a wooden paddle.

Just enough heat is used to keep the solder in a pasty condition. Final operations (Fig. 5) consist of grinding and painting.—*Based upon item in Linde "Tips," Linde Air Products Co., New York City.*

It's the Nash!

There are no mechanical complications in a Nash Compressor. A single moving element, a round rotor, with shrouded blades, forming a series of buckets, revolves freely in an elliptical casing containing any low viscosity liquid. This liquid, carried with the rotor, follows the elliptical contour of the casing.

The moving liquid therefore recedes from the rotor buckets at the wide part of the ellipse, permitting the buckets to fill with gas from the stationary Inlet Ports. As the casing narrows, the liquid is forced back into the rotor buckets, compressing the gas, and delivering it through the fixed Outlet Ports.

Nash Compressors produce 75 lbs. pressure in a single stage, with capacities to 6 million cu. ft. per day in a single structure. Since compression is secured by an entirely different principle, gas pumping problems difficult with ordinary pumps are often handled easily in a Nash.

Nash simplicity means low maintenance cost, with original pump performance constant over long periods. Data on these pumps sent immediately on request

No internal wearing parts.

No valves, pistons, or vanes.

No internal lubrication.

Low maintenance cost.

Saves floor space.

Desired delivery temperature automatically maintained.

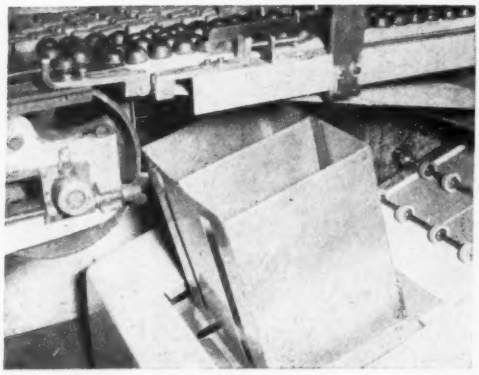
Slugs of liquid entering pump will do no harm.

75 pounds in a single stage.

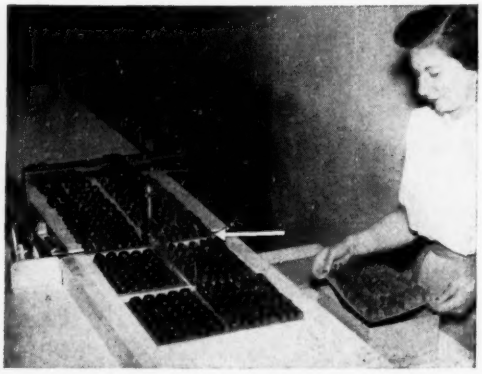
NASH ENGINEERING COMPANY

31 WILSON, SO. NORWALK, CONN.

Food Equipment News



With use of this ingenious device . . .



. . . candies come out on cardboards

Tray-Feeder Speeds Candy Packing A

Man-hours are reduced an estimated 80 percent in bulk-chocolate candy packing by a new machine which utilizes an automatic "pallet" principle.

The unit has a continuous feeder belt leading up to the packing table from the point where chocolates leave the cooler after being coated. Through the slot between the moving packing table belt and the feeder belt (see photo above, right), standard size 7x10-in. layer separators are introduced to the packing line. Chocolates from the feeder belt are automatically deposited on the cardboards, enabling a packer to pick up 40 pieces at a time and place them in stock boxes.

The machine will be built in three sizes—16-, 24-, and 32-in.—to correspond with standard enrober sizes. Two rows of cardboard layers are accommodated by the 16 in. size, three by the 24 in., and four by the 32 in. Maker states one packer can operate either of the two smaller sizes, while two packers, one on each side of the packing table, are required for the 24 in. model.

A series of adjustable "plows" suspended over the traveling belts align chocolates in even rows before the conveyor reaches the point where chocolates are deposited on the boards. A single 2 hp. variable-speed motor provides all necessary power.

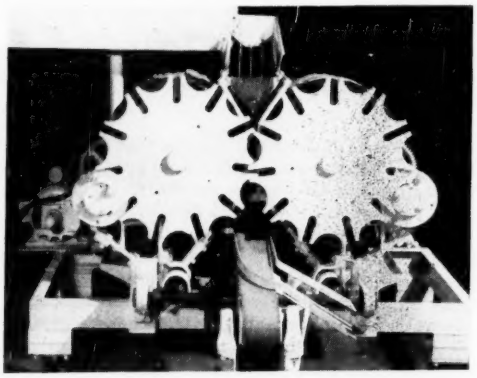
Cardboard layers, stocked in twin hoppers beneath the feeder belt (see photo above, left) travel upward on a 30 deg. angle at regular intervals. They level off at packing table height, where the feeder belt deposits the moving candy on the card. Feeder belt stops between gaps in the cards and resumes when a new card is in line.

An employee, stationed at this point, removes the layer of chocolates and places it in a stock box resting on an adjustable shelf beside the packing table. Flow of cardboard layers can be stopped to allow for direct packing in selling boxes.

The feeder and cardboard hopper unit is 6 ft. long, 36 in. high. Packing table length is optional.—*Budget Machinery & Tool Co., 406 W. Pico Blvd., Los Angeles.*

Want *More* Information?

It's free—and easy to get. Say for example, you want added details on the item marked "B" here on page 90. Simply flip to one of the special Reader Service postcards inside the front cover and circle 90B. Sign at the bottom and mail—no stamp needed. Then the extra information will be on its way to you.



Peeler Squeezes Tomato Out of Skin B

Under standard production conditions, operators have fed up to 90 tomatoes per minute to a new mechanical peeler. It is known as the Rollins.

Reported is a uniformly higher quality of product, because tomatoes can now be peeled with mechanical exactness, thus eliminating the possibility of breaking the seed cells.

The principle of the peeler is comparatively simple. It squeezes the tomato out of the skin.

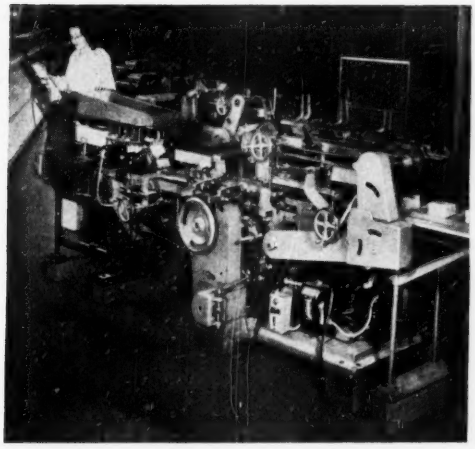
Tomatoes in single file, are fed in on a conveyor belt. The cores are dug out by a knive which plunges up and down

as the tomatoes pass. Then, the tomatoes drop off the end of the belt onto a slide and roll down between two larger revolving wheels.

Each wheel has a series of adjustable rollers forming eleven bays around the periphery. Over these rollers is a rubberized cotton knit mesh belt which runs continuously. The stretch of the belt forms a pocket around the tomato.

At a fixed point in the travel of the tomato, the wheels stop and hold the tomato momentarily. While held in this position, the mesh belt travels over the surface of the tomato and in doing so removes the skin.

When the wheels resume rotation, the peeled tomato and its skin drop to a belt directly beneath. Separation of the two follows.—*The Peeling Co., 238 N. Franklintown Road, Baltimore 23.*



For Anti-Break Cracker Wrapping A

Fitted with a new type auxiliary feed this wrapping machine is reported to avoid breakage of crackers being made up in ¼-lb. units "in the nude". It is now in operation in the Schulz-Burch Biscuit Co. plant in Chicago.

Crackers are picked up manually from a belt, placed in an inclined tray, and moved by gravity into the auxiliary feed (here, an automatic transfer from oven belt to feeder is a possibility).

Rejecting any that are broken, the unit will count out the crackers, in proper number for a ¼-lb. wrap, and deposit them into the feed conveyor of the wrapping machine. It is estimated that under normal conditions a speed of 65 units per min. can be attained.

The FA Model shown has a new type of folding and sealing line which is spring-mounted and moves in and out with the slightest variations of products being wrapped. This feature, combined with the gentle conveying through the machine during the entire process, avoids breakage.

Machine can be built for heat-sealing cellophane or waxed paper and will handle printed registered material, if desired. An "easy-open" tape can be incorporated in the wrap if desired.—*Package Machinery Co., Springfield, Mass.*

Boiler Water Treated In Two-Stages B

Through use of new resins, the virtues of the hot process and zeolite softener for the treatment of industrial water have been combined in two-stage conditioner equipment.

MR. FI IS "UP" ON EVERYTHING NEW

—And Johnny-on-the-spot, every month, he's here keeping you posted with all the cogent details. He tells you about the latest processing machines, the newest in movers and handlers, all the auxiliaries, like motors, boilers, and valves, as well as the various materials, numerous accessories, and all the rest that's up-to-the-minute for improving your operating efficiency.

In view of the still-rising costs, your Mr. FI's tip-offs on new facilities for doing it better are now twice as important. And we can say that again.

Just consider the man-hours to be saved by packing bulk candy with the automatic "card palleter" detailed in the first item on the opposite page. And note that adaptations of this same machine are seen feasible for other small-unit foods.

In short, Mr. FI does more than report to you on specific equipment for your operation. He also makes sure you're abreast of all new ideas, latest mechanical developments and principles—a must in today's highly competitive food field.

Yes, drop in here and consult regularly with your partner in progress, Mr. FI. That's the way to keep your plant up front on equipment and your operation know-how ever up to date.—The Editors

New resins used in the zeolite stage will withstand both the high temperatures and the pH values obtained in the hot process stage. Former zeolite materials, whether natural or synthetic, were unable to stand temperatures higher than 120 deg. F without disintegration.

In the new conditioner, the softener is used in the second stage The first stage, in which lime is the single reagent, precipitates the bicarbonates and magnesium, leaving the remaining hardness to be removed by the zeolite softener, utilizing salt as a regenerant.

Advantages are many, including savings in chemicals and capital investment, lower CO_2 in the steam, less floor space and head room, less operating attention, better control of phosphate excess in the boiler, and lower alkalinity. And only one chemical is needed in the hot process.—*Cochrane Corp., 17th St., below Allegheny Ave., Philadelphia 32.*

DON'T MISS THESE . . .

Versatile packer, with single operator, handles up to 180 consumer items per minute.....Page 92

Dryer uses low temperatures with very dry instead of heated air on materials.....Page 94

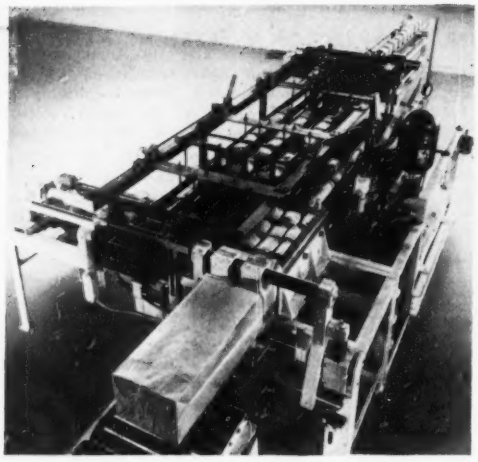
Pickling of meats is speeded and simplified by use of new balance .....Page 94

For severe steam service, impulse steam trap has body of stainless steel bar stock.....Page 98

AND WATCH FOR . . .

Filler, 30-pocket plunger-type, maintains accuracy at rate of 500 jars per min.....In Sept. FI

Moulder, for production of frankfurter and other elongated buns, uses Teflon rolls.....In Sept. FI



Versatile Packer Has High Capacity A

Employing this recently developed automatic packer, a single operator can, it is reported, compression-pack up to 180 consumer units into shipping containers every minute.

For manufacturers using a range of sizes of consumer packages, the machine's versatility is notable. With only a slight mechanical adjustment, any package in the 1 to 25 lb. range can be handled. And, interchangeable duckbills make it possible to package round corner bags as well as the rectilinear type cartons.

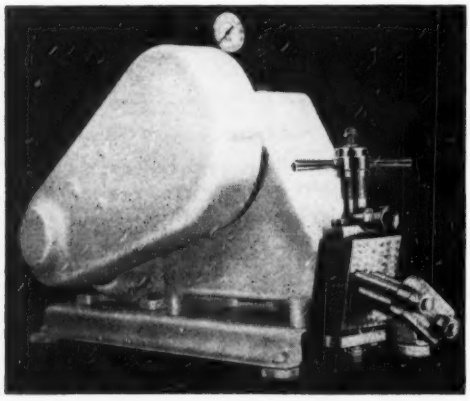
Besides labor saving, these advantages are reported:

1. Shipping container size can be reduced. This means substantial cost savings.

2. Units go in compactly so that their combined structural and columnar strength provide resistance to crushing.

3. The rectilinear containers lend themselves to shipping and palletizing without damage to the consumer packages.

Rice, sugar, flour, salt, beans, and peas are but a few of the products readily handled by the packer—*Union Bag & Paper Corp., 233 Broadway, New York City 7.*



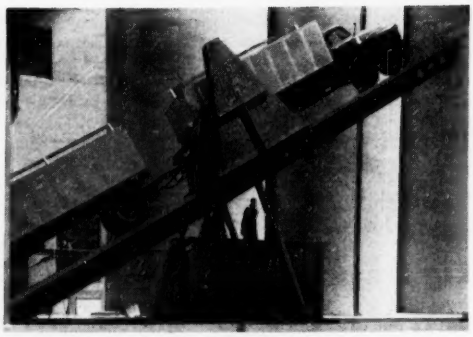
Homogenizer Has Fewer Parts B

Crankshaft, connecting rods, and crosshead guides—parts which have been commonly used—are eliminated in a new high-pressure homogenizer.

The design, simple and rugged, employs a floating piston which requires no packing. Stainless steel pressure head is hermetically sealed to prevent any possible contact of this mechanism with produce being handled. Homogenizing parts are easily disassembled for cleaning and sterilizing.

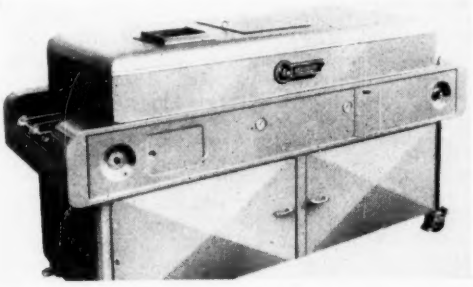
The hydraulic mechanism, being completely separated from pressure head and submerged in oil at all times, is capable of pulling a high vacuum, which is transferred to pressure head through the pulsator.

The unit is self priming. It has a capacity of 50 gpm. Motor power of ¾ to 1½ hp. is used, depending on specific pressure and capacity required—*C. W. Logeman Co., 633 Bergen St., Brooklyn 17.*



Dumps Trailers Without Uncoupling C

Though not claimed to be a new-type truck dump, maker declares it is the biggest, fastest, most convenient, and only one that will handle truck and trailer without uncoupling. Trick is accomplished by driving both on ramp, dumping trailer contents, then backing trailer off and dumping truck contents.—*Pacific Coast Engineering Co., Oak & Clement Sts., Alameda, Calif.*



Greases 8,000 Bread Pans Hourly D

Cleaner, faster and better pan greasing is reported possible with this new automatic machine.

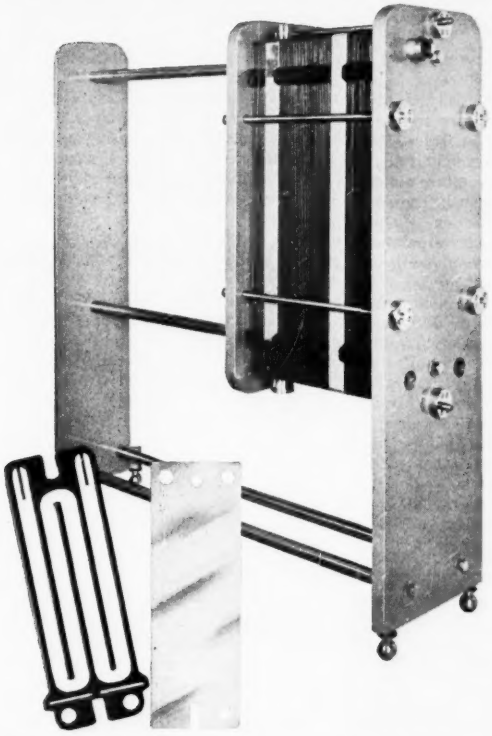
Known as the F.S.P. Pankoter, it is a completely automatic machine made of stainless steel. Castered, it is easily moved for repairs or cleaning. It weighs approximately 1,000 lb., is 4 ft. high, 7 ft. long, 33 in. wide.

Pans conveyed into the unit are positioned under the spray mechanism, which then releases grease or oil into the upright pans by use of trip levers. This method saves on oil or grease used.

In this manner, as many as 8,000 individual pans per hour are automatically handled.—*Ferry Steel Products & Equipment Co., 970 Folsom St., San Francisco 7.*

Something Really New... Pfaudler

"SANI-PLATE" FILM FLOW HEAT EXCHANGERS!



FEATURING ADVANCED SANITARY DESIGN

Pfaudler announces a plate heat exchanger with the same advanced sanitary design features that mark all Pfaudler equipment. Field tested for three years as the United unit, Pfaudler now brings it to you with improved features.

The Pfaudler "Sani-Plate" departs from conventional design through the elimination of plate corrugations and gaskets fastened to steel, both of which are possible sources of bacterial contamination. Pfaudler "Sani-Plates" are perfectly smooth, made of polished stainless steel. They are separated with sanitary divider seals which direct product and medium completely across the plate for fast heat exchange. Simplicity and sanitation keynote design.

Now dairies, *large and small*, can cool, heat or regenerate in a plate heat exchanger for greater economy—capacities from 1000 lbs. minimum to 20,000 lbs. per hour! Pfaudler HTST pasteurizers are equipped with accurate controls, pumps, holding tubes and balance tank, all built into the unit. For further information and prices, use form below.

TYPICAL SATISFIED USERS

Borden Company, Mfg. Division	Elgin, Illinois (3)
Seeley Dairy Company	Chicago, Illinois
Minnesota Creamery Company	St. Paul, Minnesota (2)
Furnas Ice Cream Company	Des Moines, Iowa
Western Condensing Co.	Eldorado Springs, Missouri
Dailey Pickle and Canning Co.	Saginaw, Michigan
Mendota Cheese Company	Mendota, Illinois
Lanes Jersey Dairy	El Paso, Texas
M. Stephens Company	Chicago, Illinois (2)
Eagle Dairy Products Co.	Detroit, Michigan (2)
Chocolate Products Company	Chicago, Illinois
Croswell Pickle Company	Croswell, Michigan
Morrocco Wine Company	New Brunswick, New Jersey
Stokes Dairy Farms	Franklin Lakes, New Jersey
U. S. Dept. of Agriculture	Albany, California
Snee Dairy Company	Pittsburgh, Pennsylvania

. . . and many, many others

EASY TO CLEAN—Smooth polished stainless steel plates are easy to clean. One-piece rigid sealers, coated with thermoplastic, are odorless, tasteless, heat resistant and sanitary. No crevices where rubber joins steel to worry about.

INEXPENSIVE TO INCREASE CAPACITY—Plates and sanitary sealers are easy to remove and insert, permitting adaption of any unit for different applications quickly.

BUILT FOR HIGH PRESSURES AND TEMPERATURES
The design of this unit is such that pressures as high as 50 psi. are considered normal. Materials are approved for temperatures up to 250° F.

The Pfaudler Co., Dept. FI-7, Rochester 3, N.Y.

Please send more information about the New Pfaudler Sani-Plate Film Flow Heater. Capacity required _____

Name _____

Company _____

Address _____

City _____ Zone _____ State _____

Pfaudler

THE PFAUDLER CO., ROCHESTER 3, NEW YORK
Engineers and Fabricators of Food Processing Equipment

GLASS-LINED STEEL
Hastelloy—Aluminum
Tantalum—Carbon Steel
Solid or Clad Stainless Steel
Nickel, Inconel, Monel

CUT FOOD HANDLING COSTS as much as 1/3

with Buschman CONVEYORS

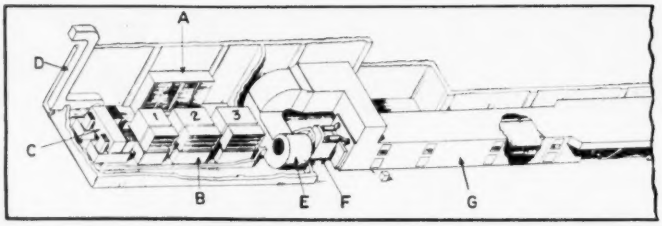
• Whether it's food in process, bagged or packaged, there's a Buschman Standard or Special Conveyor to save time, floor space and costs! Food in process or in bags can be handled, at less cost on BUSCHMAN roller, belt or overhead trolley conveyors. Assembled without welding, convenient standard units give you a custom-made installation at ready-made prices. Light, easily moved sections can be used anywhere, moved in minutes; serve equally well in factory, warehouse or shipping docks.

Diversified ability resulting from years of experience in every type industry enables BUSCHMAN engineers to economically solve your food handling requirements.

WRITE FOR CATALOG

Buschman Conveyors

THE E. W. BUSCHMAN CO., Inc.
4475 Clifton Ave.
Cincinnati 32, Ohio



Uses Low Temperatures To Dry Materials A

Substances that do not withstand the high temperatures of conventional methods are reported easily dried in a new unit using very dry instead of heated air to extract moisture.

The advantage of dehumidifying as opposed to high temperature-air drying, according to the maker's engineers, is that faster drying action is accomplished at close to room temperatures. Thus, heats that are sometimes damaging to materials are not needed.

The air is dehumidified in an absorption-type humidity control device using a hygroscopic lithium chloride solution (Kathene) as the absorbent. The system controls humidity accurately and automatically, regardless of moisture level variations in the incoming air. It is said to require only a small amount of electric power, circulating water, and heating steam.

In the new dryer dehumidified air enters the tunnel at practically room temperature. As it passes over and through the materials being dried it picks up moisture. To hold high absorbing capacity, the air is heated slightly at the same time. Hence, air at the end of the tunnel will have a considerably higher moisture content, but its moisture absorbing capacity will be maintained by raising its temperature as it progresses along the tunnel. This is accomplished by steam heaters placed at different zones in the tunnel.

One of the features of the dryer is that a relatively small amount of air is used. Component parts (see photo) are: (A) fresh air intake; (B) Kathabar humidity control units; (C) Kathene regenerator; (D) scavenging air exhaust, for venting moisture-laden air from the regenerators; (E) main blower; (F) Votator feeds; and (G) the tunnel itself, containing continuous conveyors.

Designed by Douglas M. McBean, Inc., consulting engineering firm of Rochester, N. Y., the unit is marketed by—*Surface Combustion Corp., Toledo, Ohio.*

Pickling Is Speeded By New Balance B

Injection of the correct amount of "pickle" into meats is reported simplified and speeded by use of the new Model S-2 Prague Pickle Balance.

The new unit combines a scale and a calculator. The scale platform, on which are mounted stainless steel rods in a level position, slopes to allow for quick drainage of pickle from the platform. Splash guard, in back of the platform, keeps pickle from squirting upward and obscuring dial glass.

The calculating device, also of stainless steel, is mounted at the back of the scale case, so that it does not have any contact with the weight mechanism. By turning knob at front of scale (see photo), calculating mechanism may be moved along the top part of the dial until the black (left hand) needle coincides with the bottom needle.

When this is done, the red percentage needle (on the right) automatically advances and assumes the position which indicates the total required weight (weight of meat plus weight of pickle to be added). The operator simply adds pickle until the bottom (weighing) needle coincides with the red percentage needle.

Throughout the operation, the unit shows weight of the piece of meat before and after pumping. The standard chart reads to 35 lb.—*The Griffith Laboratories, Inc.*, 1415-31 *W. 37th St., Chicago*, 9.

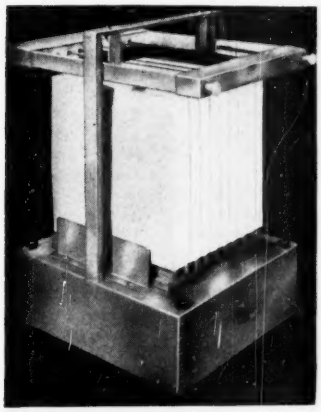
Stainless Bellows-Pump Features Constant Rate A

A completely stainless steel micro-bellows pump has been announced.

The new unit, primarily developed for laboratory-scale pumping of materials which are liquid at room temperature, can be adapted to handle low boiling liquids, melted solids and viscous materials.

It is a pulsation type pump that delivers at a constant rate over long periods of time. The rate can be varied by regulating the size of bellows. Rate with a ½ in. bellows is 15 to 1,000 ml. per hr.; with ¾ in. bellows it is 30 to 2000 ml. per hr.

Pump has no packing gland or stuffing box, eliminating all dangers of contamination of product by lubricants.—*Research Appliance Co., Box 413, West View Road, Pittsburgh 9.*



Cuts Dry Ice Cubes Into Handy Slabs B

Standard blocks of dry ice are now automatically cut by a new electrical device into slabs 10 in. square by 1 in. thick. Low voltage wires in a gravity-feed frame do the cutting.

Firms using dry ice in their industrial operations are faced with the problem of cutting the material to meet requirements. Generally, the practice has been to either cut the standard 50-lb., 10 in. block to the desired size by using a band saw, which is a hazardous practice, or to anticipate requirements and order to size in advance. The latter involves paying a premium for the pre-cutting of the slabs as well as increasing the rate of shrinkage of the ice while waiting to be used.

The new slabber is offered as a solution. Stated to be safe, the new unit is equipped with an automatic switch

"PUSH-PULL" PAPER FEED

PROVIDES BETTER WRAPS

BULL'S EYE REGISTRATION
NO CROOKED WRAPS
NO TIME LOST RE-ADJUSTING

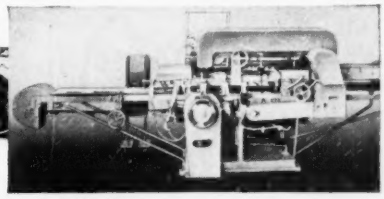
In plants where our Model FF Frozen Food Wrapping Machine has been installed, users quickly notice a real improvement in the wrapping of their packages. This is due in great part to the machine's superior type of paper feeding mechanism. Whereas conventional machines *push* the paper through the machine, the FF *pushes* the wrapping material by means of rollers and at the same time it *pulls* it through on belts. This results in a more positive feed that keeps wrappers straight and enables the electric-eye registration of printed material to be controlled with perfect, uniform accuracy.

You'll also find that the FF is an extremely accessible machine—you can get at parts more easily for adjustment or cleaning.

Fast too—turns out well over 100 packages per minute. Handles either cartons or metal-end fibre cans. Automatically makes allowance for variations up to ⅜" in the width of packages.

Wraps with any type of material used for frozen foods and is quickly adjustable for various sizes.

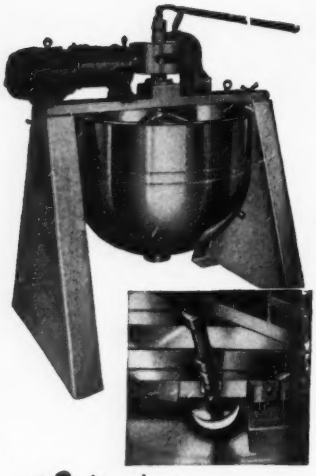
Write our nearest office for full particulars.



FOR SALES PRODUCING WRAPS AT LOWEST COST...IT'S THE FF

PACKAGE MACHINERY COMPANY
PALMER DIVISION
SPRINGFIELD, MASSACHUSETTS

NEW YORK CHICAGO BOSTON CLEVELAND ATLANTA DALLAS
DENVER LOS ANGELES SAN FRANCISCO SEATTLE TORONTO MEXICO, D.F.



POP the valve open...
POP the valve shut...
and this agitator keeps mixing all the while... DOUBLE MOTION!
(Valve diameter up to 6")

It's the newest in kettles...

The HAMILTON
Roto-Speed "MIX-COOKER"!

We believe it to be the finest steam-jacketed kettle for products which tend to settle or choke up. Cooks fast. Mixes thoroughly. Empties fast and clean. Operates at a touch. We'd like to tell you all about this "MIX-COOKER" for "problem products." Users are happy!

Write for complete Hamilton Kettle Catalog

HAMILTON
COPPER & BRASS WORKS, INC.
1765 Dixie Highway Hamilton 5, Ohio

one of the
ALVIN HOCK INDUSTRIES

that shuts off when the slicing is completed.

Where small cubes are desired, these slabs may each be cut into 20 cubes measuring 2½ x 2 x 1 in. by means of a second unit which has been made available.—*Foster-Built Bunkers, Inc., 757 W. Polk Street, Chicago 7.*

Added Strength Marks New Aluminum Barrel A

To withstand rougher handling, a new, heavier gage aluminum beer barrel of 31-gal. capacity is now being produced. It features a deeper chime and results in more rugged construction.

Inner surfaces of the new full barrels consist of high-purity aluminum bonded to a high-strength, heat-treated Alclad aluminum alloy exterior. Bungs are forged from a solid piece of aluminum and attached by the argon arc welding process, said to completely eliminate concealed joints and overlapping welds.

According to the maker, the high-purity aluminum inner surfaces simplified cleaning and protect taste, color and clarity of the beers the barrels contain.—*Aluminum Co. of America, 801 Gulf Bldg., Pittsburgh 19.*

Vertical Turbine Pump Has High Capacity B

Glass-lined bowls and bronze impellers are used in a new, small, vertical turbine pump recently introduced. Efficiency of this liquid mover is termed high.

Named the "Watermaster", it is adaptable to deep wells as small as 4-in. dia. and, according to maker, has up to 40 percent more capacity than the average pump in its class.

Equipped with a vertical hollow-shaft electric motor, the new unit delivers 15 to 115 gpm. and under certain conditions 140 gpm. Design features include an adjustment on the drive head to change capacity or pressure in one quick operation.

An oversize foot valve holds water in the column at all times, assuring instant, positive lubrication of bearings and shaft journals. Valve face is rubber lined, and it is mounted in an inclined position to prevent sticking or clogging in the presence of sand.

Provided in 5 ft.-column sections, the pump is easy to install, particularly in locations where there is limited overhead room.—*A. O. Smith Corp., Milwaukee.*

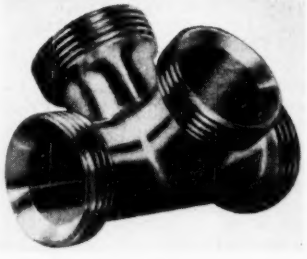
Pan Cleaning Compound With Tell-Tale Color C

For cleaning bread or cake pans by tank or machine methods, a new material, Composition No. 41, has been developed.

Containing a special chromate ingredient, the new product is reported to provide powerful cleaning action while affording maximum safety for the baking surfaces. Supplied in powder form, it is completely soluble in warm or hot water.

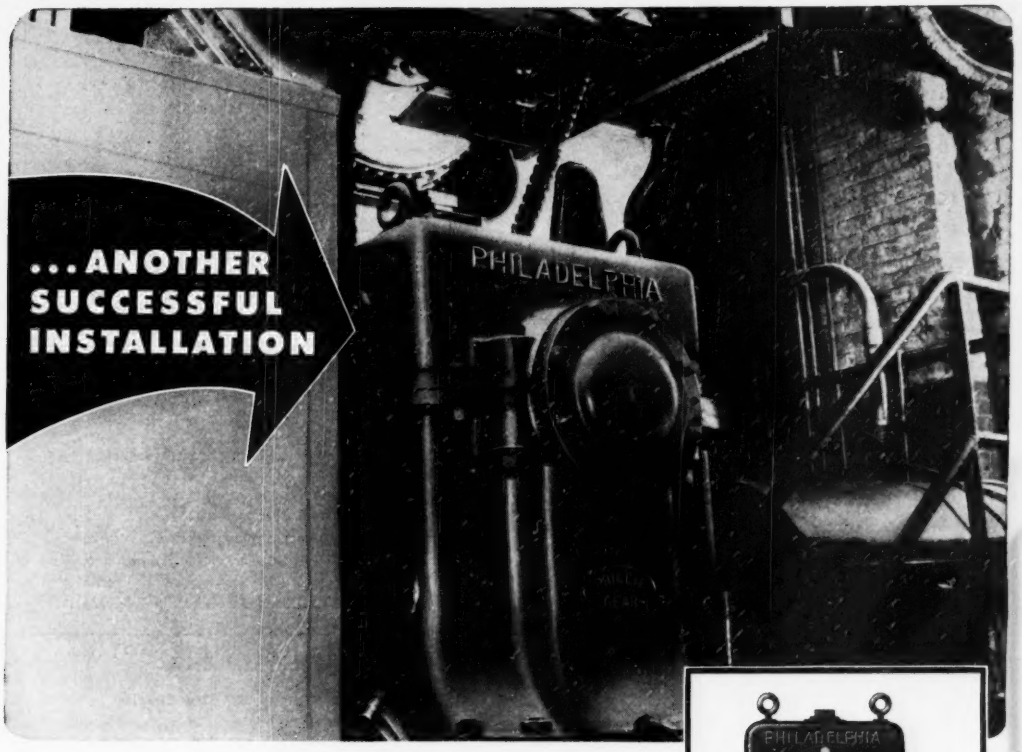
Its solutions are yellow in color, with this color gradually changing in use and finally turning a definite green to indicate when excessive contamination is present. Solutions have long life, it is said, and continue to clean efficiently even after large volumes of work have been passed through.

In tanks, concentrations ranging from 1 to 6 oz. per gal. of water are recommended, depending upon condition of pans, with temperatures ranging from 170 deg. F. to boiling. In bakery washing machines, concentrations of ¼ to ½ oz. per gal. at 140 deg. F. are suggested.—*Oakite Products, Inc., 157 Thames St., New York City 6.*



New Sanitary Fitting D

Made of stainless steel, this fitting is a standard No. 7 tee with a 90 deg. side port, all ends threaded. It is available in sizes from 1- through 4-in.—*Universal Machining Co., Inc., Kenosha, Wis.*

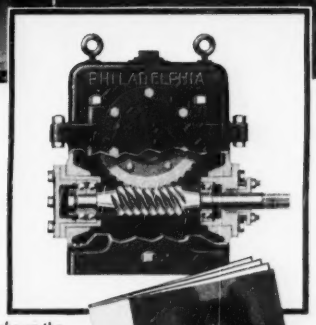


This Philadelphia Worm Gear Reducer driving a mixer in a Sugar Refinery

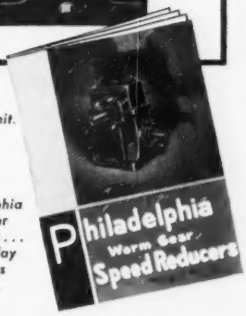
Indicating the wide adaptability of Philadelphia Worm Gear Units, is this installation of a Type AX unit in a molasses distillation plant, driving a mixer through an overhung chain assembly.

Philadelphia Worm Reducers are built in all types and in a full range of sizes and reduction ratios, for vertical or horizontal drives. All are scientifically designed, incorporating many important refinements which have been developed through our many years experience in meeting the varied drive requirements of all kinds of industries.

Every Philadelphia Worm Reducer is a custom made product, embodying standard fundamental principles, but having individual service characteristics that assure its performing the required job with maximum efficiency and economy and minimum maintenance.



Above is shown the worm assembly of a heavy duty Type AT unit.



Make the Philadelphia Worm Gear Reducer Catalog your guide . . . send for a copy today . . . on your Business Letterhead, please.

Philadelphia Gear Works, INC.

ERIE AVE. AND G ST., PHILADELPHIA 34, PA.
NEW YORK • PITTSBURGH • CHICAGO • HOUSTON
IN CANADA: WILLIAM AND J. G. GREEY LIMITED, TORONTO

Industrial Gears and Speed Reducers
LimiTorque Valve Controls

THE SHELF-SHAPE BAG THAT PACKS WITHOUT SLACK

Deltaseal®

One reason why more manufacturers are turning to the DELTASEAL PACKAGING SYSTEM*

Deltaseal Bags are flat . . . top and bottom . . . so, they're easy to stack in attractive, space-saving displays. There's no slack-pack appearance to discourage sales. The Deltaseal closure helps the bags keep that full-pack look. Housewives like this closure, too, because the "built in" spout makes easy pouring.

Deltaseal lowers packing costs. Deltaseal Packaging Machinery is designed for Deltaseal bags alone. It fills, shapes and closes the bags fast . . . 2,000 or more an hour, depending on the commodity. Mostly automatic, it handles volume packing with real efficiency.

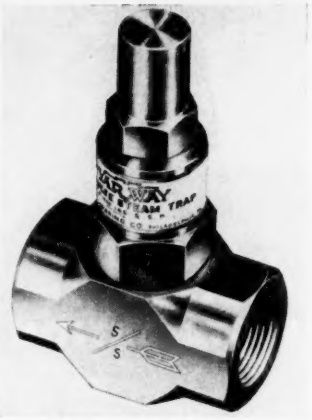
Let a Bemis representative explain more of the benefits in the Deltaseal Packaging System. Call or write your nearest Bemis office.

*THE DELTASEAL PACKAGING SYSTEM
Deltaseal Bags plus the Deltaseal Packaging Machinery.

BEMIS BRO BAG COMPANY

Bemis

Baltimore • Boise • Boston • Brooklyn • Buffalo • Charlotte • Chicago
Cleveland • Denver • Detroit • East Pepperell • Houston • Louisville
Indianapolis • Jacksonville, Fla. • Kansas City • Los Angeles • Mobile
Memphis • Minneapolis • New Orleans • New York City • Norfolk
Oklahoma City • Omaha • Peoria • Phoenix • Pittsburgh • Salina
St. Louis • Salt Lake City • San Francisco • Vancouver, Wash. • Seattle
Wichita • Wilmington, Calif.



For Severe Steam Service A

Additional resistance to the abrasive wear and corrosion encountered in hard duty steam trapping service is provided by this impulse steam trap featuring a body of stainless steel bar stock.—*Yarnall-Waring Co., Mermaid Lane, Philadelphia 18.*

Equipment Briefs

For Fast, Easy Floor Cleaning B

Seven features which operators have found helpful and practical, are reported incorporated in a new all-purpose floor cleaning machine. These include: Rotary safety-grip switch, fingertip solution control, fully adjustable handle, self-raising wheels, automatic brush coupler, foam-feed brush design, and quick-change, snap-on brush rings.—*Breuer Electric Mfg. Co., 5100 Ravenswood Ave., Chicago 40.*

Determines Product Consistency C

To measure the consistency of cream style corn, catsup, tomato paste, baby food, and like products, a new consistometer has been designed and tested. Accurate consistency readings are given on the instrument's dial face. Baked white enamel finish, polished stainless steel turntable, and streamlined body design are features.—*Food Machinery & Chemical Corp., San Jose, Calif.*

Valve Maintains Dairy Code D

Greater protection for the public is seen provided by a recently developed valve for use in the dairy plant. For if any operations are counter to the health code, the new device, a self-coupling valve, will halt the entire plant. Through a system of internal contacts and electric switches, the valve actuating mechanism detects any faults in the assembly.—*Industrial Div., Minneapolis-Honeywell Regulator Co., 4502 Wayne Ave., Philadelphia, 44.*

Concrete Floor Paint Dries Fast E

Paint jobs on concrete floors are reported simplified through use of a tough, quick air-dry, clear vinyl coating. The coater can be applied within 4 hr. after the primer, with the floor returned to traffic 2 hr. later. Coating is stated to resist gasoline, oils, greases, animal fats and many chemicals.—*The Wilbur & Williams Co., Greenleaf and Leon Sts., Boston, 15.*

—*End*

First ingredient of a successful carton ...GRAY matter!

A few of the nationally famous companies who use United Board & Carton services

Armour & Co.
Diamond Match Co.
The Electric Auto-Lite Co.
General Motors Corp.
Goodyear Tire & Rubber Co.
Lily Tulip Cup Corp.
The Kroger Co.
U. S. Gypsum
Tobin Packing Co., Inc.
Peter Cailler Kohler

Trained minds go to work the minute you tell us your packaging problem!

ENGINEERS figure costs, economy, compactness, production;

MERCHANDISING brains study the possibilities for display, sales appeal, advertising value and name identification;

ARTISTS decide upon design, visibility, suitability to the product's needs, and the all-important color selection;

PRODUCTION MEN work out such practical problems as board weight, printing quality, ink standards, die, cut and score requirements.

A HALF CENTURY OF KNOW-HOW

The skill, know-how and specialized training that go into the building of your cartons are very important values to you. They frequently are worth far more than the actual carton itself. Let us tell you how United Board & Carton's half-century of experience can mean dollars in your pocket. It costs nothing to find out. Just write or wire.

UNITED BOARD & CARTON CORPORATION

58 SOLAR ST., SYRACUSE, N. Y.

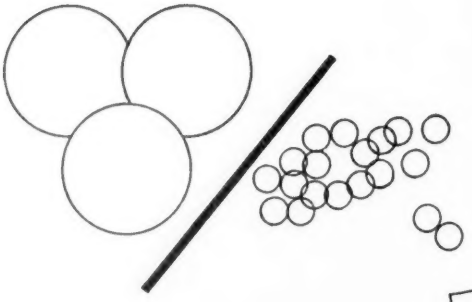
Board Mills: LOCKPORT, THOMPSON, N. Y., URBANA, O.; Carton Plants: SYRACUSE, VICTORY MILLS, COHOES, BROOKLYN, N. Y., SPRINGFIELD, O.

90% monoglyceride content

MOST POTENT MONOGLYCERIDE EVER OFFERED!

MYVEROL

DISTILLED MONOGLYCERIDES



Two types available...

TYPE 18-85

A plastic fat made from refined cottonseed oil.

TYPE 18-05

A flaked solid glyceryl monostearate.

Send for samples

We'll be glad to send samples, specification sheet, and quotations. Write, wire, or phone.

DISTILLATION PRODUCTS *industries*

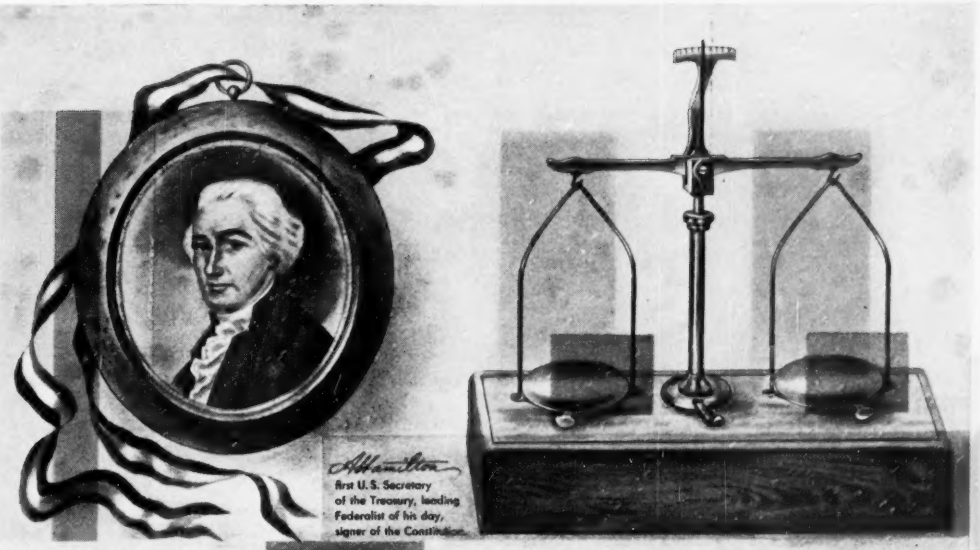
DPi

723 Ridge Road West, Rochester 3, N. Y.
Division of Eastman Kodak Company
570 Lexington Avenue, New York 22, N. Y.
135 South LaSalle Street, Chicago 3, Ill.
Gillies & Loughlin, Los Angeles and San Francisco
Charles Albert Smith, Ltd., Montreal and Toronto

"Myverol" is a trade-mark.

Distillers of Oil-Soluble Vitamins and Other Concentrates for Science and Industry, Manufacturers of High Vacuum Equipment

GREAT IDEAS OF WESTERN MAN... ONE OF A SERIES



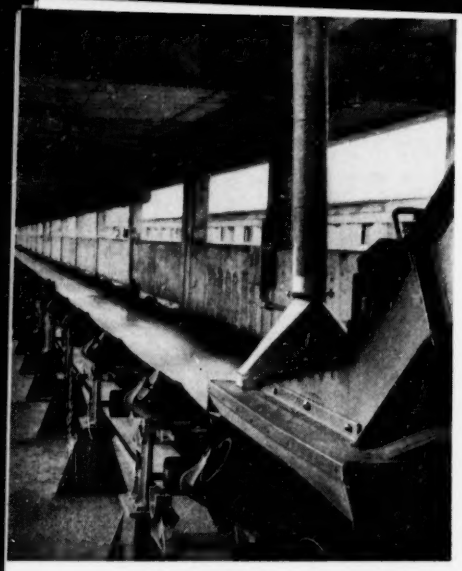
A Hamilton
first U.S. Secretary of the Treasury, leading Federalist of his day, signer of the Constitution

ALEXANDER HAMILTON
on human nature and government

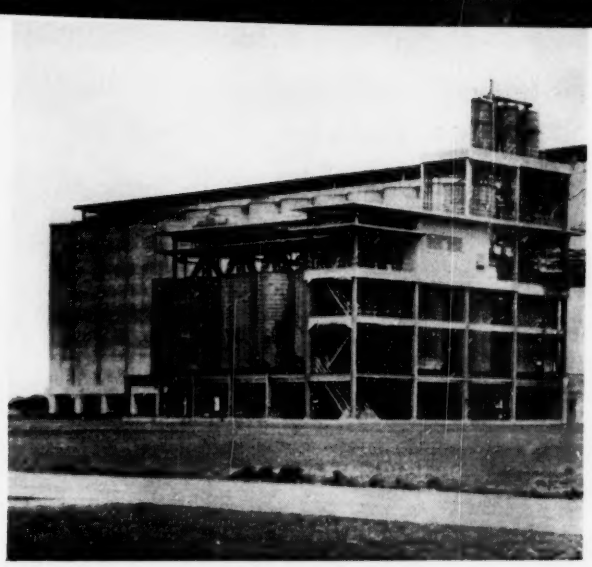
If men were angels, no government would be necessary. If angels were to govern men, neither external nor internal controls on government would be necessary. In framing a government which is to be administered by men over men, the great difficulty lies in this: you must first enable the government to control the governed; and in the next place oblige it to control itself.

A Williams
Artist: Arthur Williams

CONTAINER CORPORATION OF AMERICA



1 **BELT CONVEYOR** carries grain to storage tanks—capacity 2,000,000 bu.



2 **STEEP TANKS** (foreground) use SO_2 containing water in which grain is conditioned for separation of components.

Starch, Oil and Feed from Sorghum Grains

Advanced Equipment Now Makes Wet Milling a Continuous Process

THE FIRST specifically designed sorghum grain processing plant—incorporating innovations that have revolutionized wet milling—is graphically illustrated in the accompanying pictures and foldout flowsheet.

Known as the Bluebonnet plant, the facility is operated by the Corn Products Refining Co., at Corpus Christi, Tex.

Grain is received in both trucks and railroad cars. It is first cleaned, scoured, then conveyed to storage, steephouse or dryer, depending upon moisture content. Screw conveyors, bucket elevators, pneumatic lines and belts—Point 1 in the diagram—are employed as carriers for incoming grains.

Water from the steeping process is concentrated in a triple effect evaporator. The resulting heavy syrup is pumped to the feed house, where it is combined with protein stock feed.

Steeped grain is dewatered and passed to degerminating mills. Here, the grain is broken up to permit recovery of the germ. Ground material moves to the germ separators. The germ, from these units, is then screened, dried in a rotary dryer, and distributed to expellers—Point 4. Oil from the expellers is filtered in a plate and frame press and shipped in tank cars to the company's plant in Illinois for refining. Cake from the expellers is moved to a mill, where it is ground prior to being combined with other stock feed components.

Returning now to the germ separators, the endosperm is conveyed to disintegrators. Here, the fine and coarse fibers are separated. The coarse fibers go to a pulp press, flash dryer, and rotary cooler, then are bagged as stock feed.

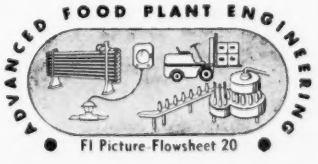
The fine fibers (starch and gluten) from the disintegrators go to vibrating screen. The overflow from this screen is returned to a repulping mill, thence to a second screen. Overflow fibers from this second screen become stock feed. Starch and gluten, the under-flow from the screen following the disintegrator, are fed to a drum filter.

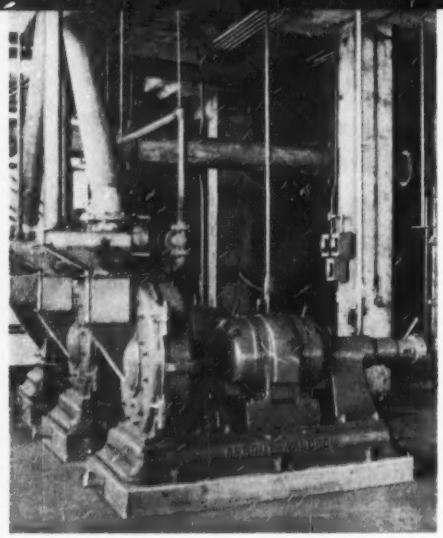
Water from this filter is returned to the steep tank. Starch and gluten are picked up with water and pumped to two-stage (Merco) centrifugals. These machines separate the starch and gluten. Having the lower specific gravity gluten moves upward in these units and is discharged at the top of the bowl. Meanwhile, the heavier starch granule is forced to the periphery, by centrifugal action, and is then discharged through nozzles in the bowl to a vent box.

Starch from this vent box travels to a vacuum drum filter—Point 8. It is picked up with fresh water and pumped to a second vacuum drum filter. Cake from this filter is conveyed to a dryer. Starch from the dryer is pneumatically conveyed to storage hoppers, then bagged and shipped.

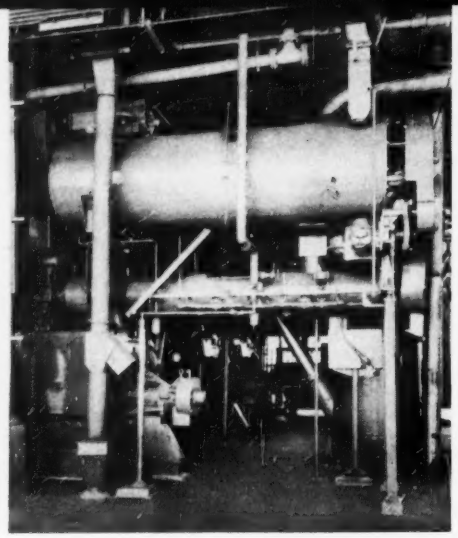
The separated gluten passes to another group of centrifugals—continuous dewatering units (De Laval). Water from these centrifuges is returned to process, and the concentrated gluten is pumped to the feed house, where it is dewatered, dried, and becomes protein stock feed.

FOOD INDUSTRIES August 1950 Pages 102-105

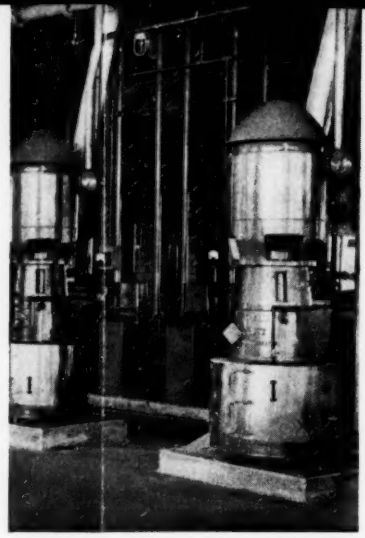




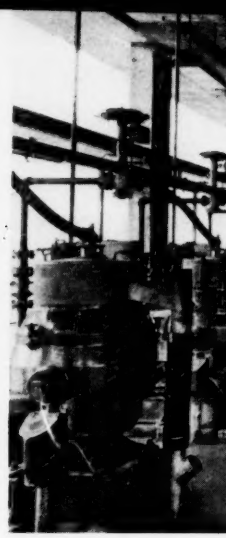
3 **DEGERMINATING MILLS** break up steeped grain for separation of germ and endosperm.



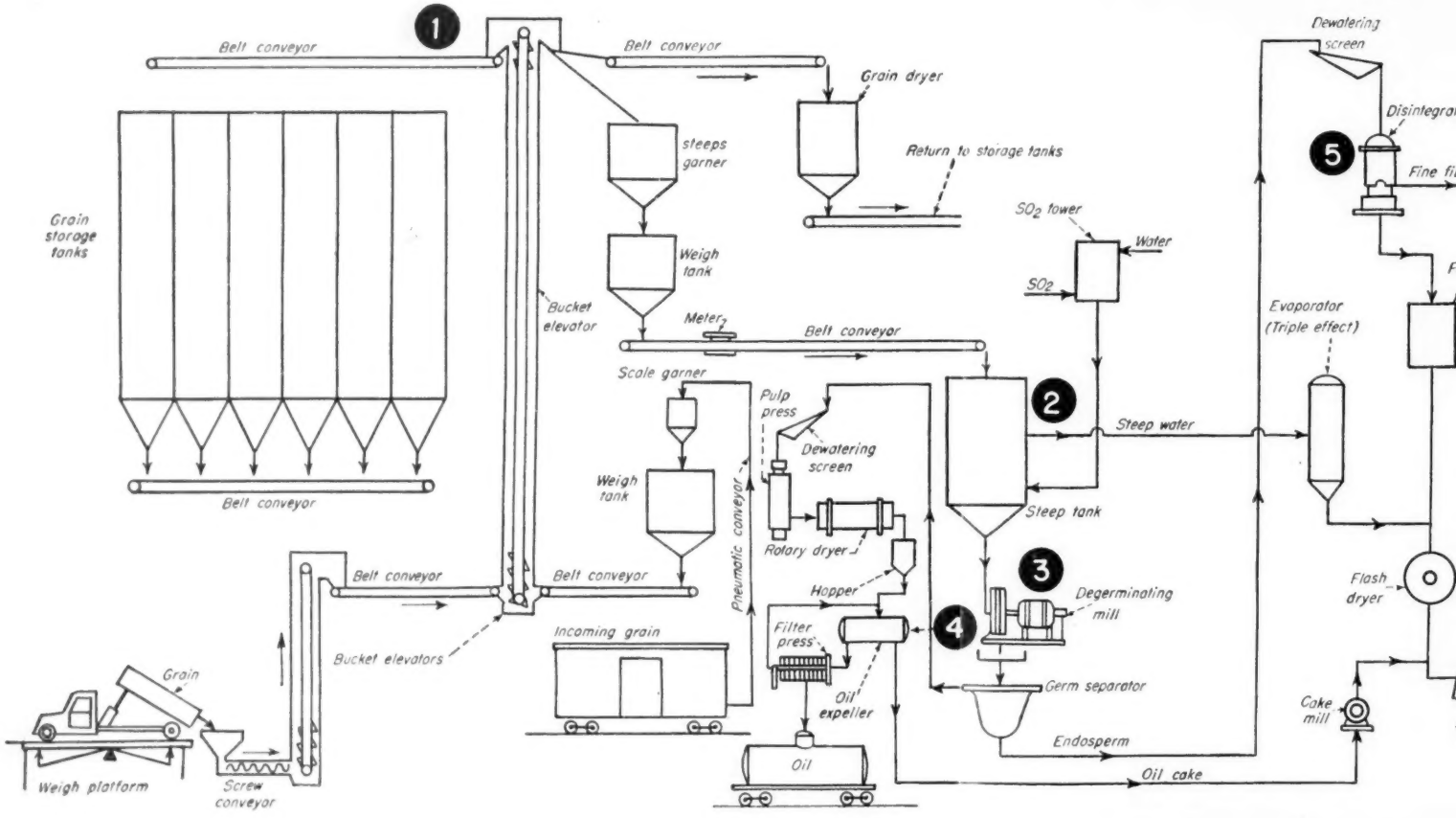
4 **OIL** is expressed from germ in the feed house by these high pressure continuous screw expellers.



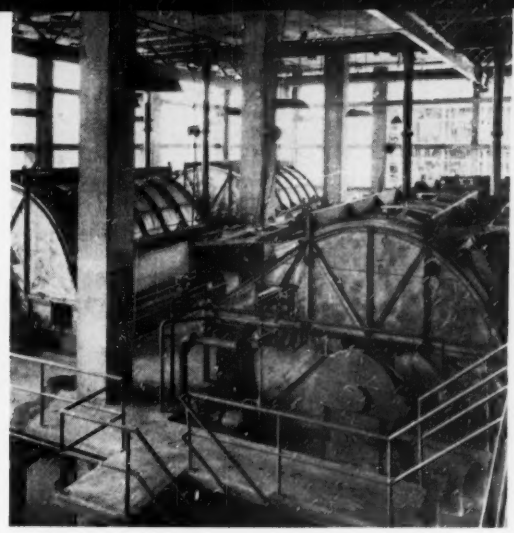
5 **DISINTEGRATORS** prepare germ-free grain for recovery of starch granules.



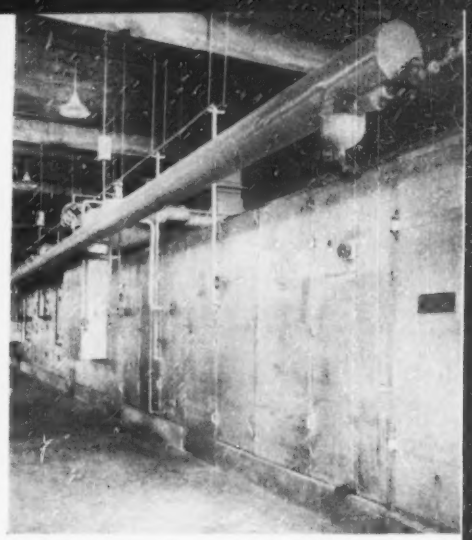
6,7 **CENTRIFUGALS** h
gluten. Battery on le



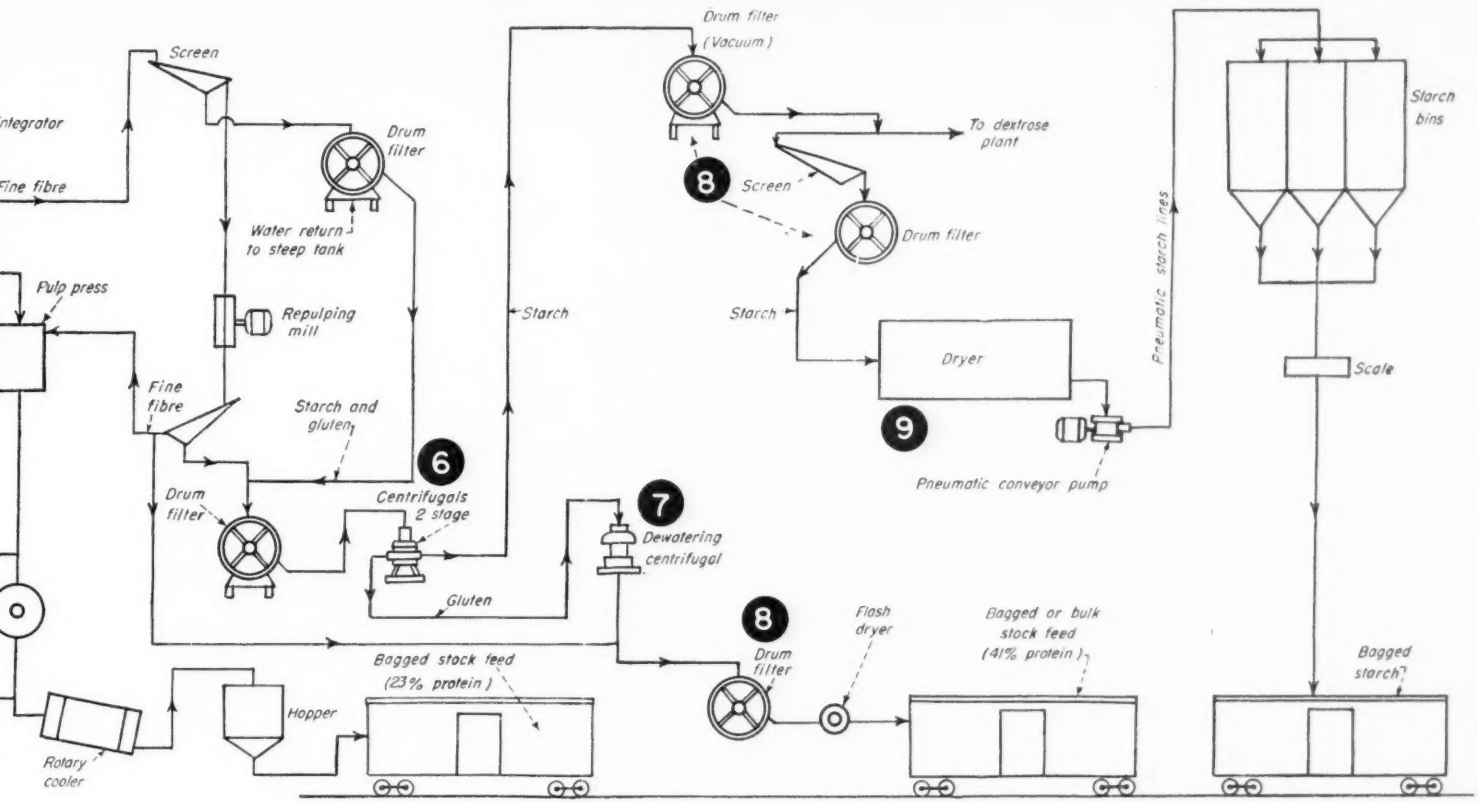
ALS have made the process continuous. Group on right remove starch from
on left. (dewatering centrifuges) concentrate high protein gluten.



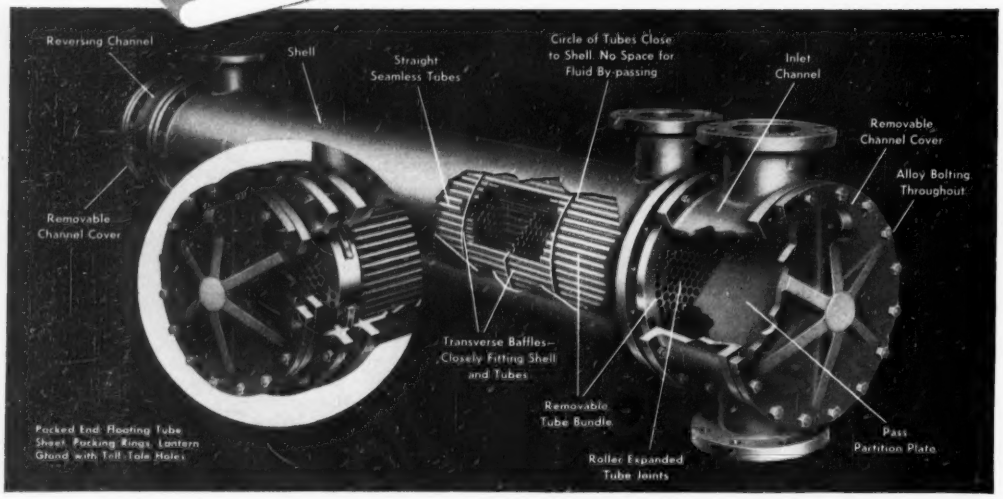
8 **ROTARY DRUM** vacuum filters on left receive flow of starch. Those on right handle glutten slurries.



9 **STARCH DRYERS** complete removal of water. Dried starch is then bagged and shipped.



now a smaller exchanger to handle a larger volume


Reversing Channel
Shell
Straight Seamless Tubes
Circle of Tubes Close to Shell. No Space for Fluid By-passing
Inlet Channel
Removable Channel Cover
Alloy Bolting Throughout
Removable Channel Cover
Transverse Baffles—Closely Fitting Shell and Tubes
Removable Tube Bundle
Pass Partition Plate
Packed End Floating Tube Sheet. Packing Rings, Lantern Gland with Tell-Tale Holes
Roller Expanded Tube Joints

Ross Research Reduces Size-Cost Requirements For Many Installations

For years, one of industry's most widely used, removable bundle exchangers, Ross Type CP now offers still more heat transfer capacity without increase in size.

As a result, it is possible in many instances for a smaller, less costly exchanger to handle a volume formerly calling for a larger unit.

MORE TRANSFER SURFACE — INCREASED TRANSFER RATE

A new tube layout, incorporating an added circle of tubes close to the shell (in the space so frequently left open in conventional designs) not only increases surface, but improves flow characteristics. Moreover, new techniques achieve closest possible clearances with utmost accuracy and uniformity, adding substantially to heat transfer rate.

LOW FIRST COST — QUICK DELIVERY

Add savings in space and cost, to the already well known benefits of low purchase price and quick delivery made possible through standardization and stocking of parts, and it's easy to see why Ross Type CP, now more than ever, is industry's leading removable tube bundle type exchanger.

FREE CATALOG

Get details on these and other famous Ross features such as easy-to-clean, straight tube design . . . wide latitude of connection locations . . . ease of installation . . . in new file-size Bulletin 2.1K1. Write.

ROSS HEATER & MFG. CO., INC., Div. of American Radiator & Standard Sanitary Corp., 1443 West Ave., Buffalo 13, N. Y. In Canada, Horton Steel Works, Limited, Fort Erie, Ont.

ROSS

EXCHANGERS

Serving home and industry

AMERICAN STANDARD • AMERICAN BLOWER • CHURCH SEATS • DETROIT LUBRICATOR • KEWANEE BOILERS • ROSS HEATER • TONAWANDA IRON

Profitable way to purch
. . . Get <u>everything</u> from

SMALL STEEL LIFT CHECKS WITH BETTER

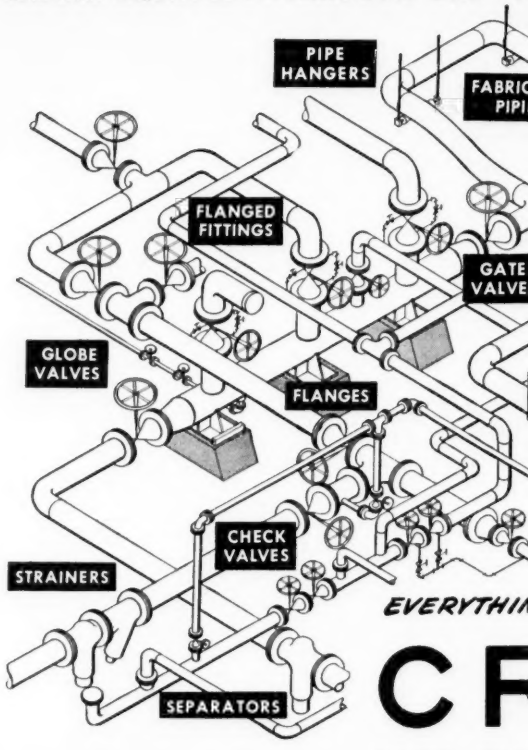
Looking for small steel lift checks that don't cha have extremely low pressure drop? Then spec Crane 600-Pound Forged Steel Lift Checks. The patented cap-sleeve construction that provides lift, even at low velocities, thereby eliminating d pounding and chattering. Special design of body and port openings give unusually low pressure dr

Seats and discs are of wear-resisting Crane Rugged, forged steel bodies will withstand sev pressure services.

You can get these checks with union caps, sc socket welding ends, sizes ¼ through ¾ inches. bolted cap, screwed, socket welding, or flanged sizes ½ through 2 inches. See your No. 49 Crane pages 248-249.

CRANE CO., 836 S. Michigan Ave., Chicago
Branches and Wholesalers Serving All Industrial

● THIS HIGH PRESSURE STEAM SYSTEM CRANE-EQUIPPED . . . THROUGH ONE PU



EVERYTHI

CR

VALVES • FITTI

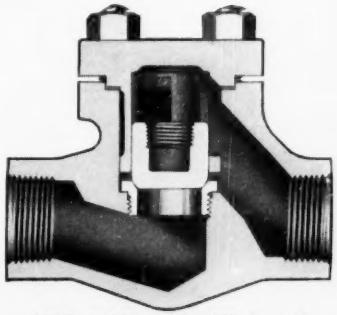
rchase piping
om CRANE

ETTER FLOW

n't chatter, and
n specify these
s. They have a
vides high disc
ing destructive
body contours
ure drop.
Crane Exelloy.
d severe, high

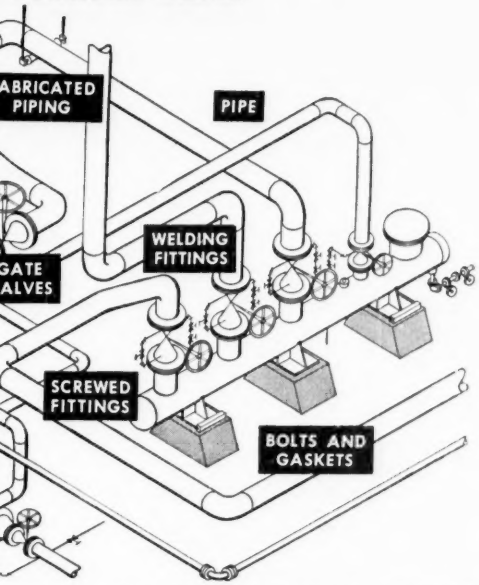
ps, screwed or
nches. Or with
anged ends, in
Crane Catalog,

icago 5, Ill.
ustrial Areas



600-Pound Forged Steel Horizontal Check with Bolted Cap. For steam, water, air, and gas up to 850° F.; for oil or oil vapor up to 1000° F. Sizes: ½ to 2-in. Screwed, flanged, or welding ends.

TEM CAN BE 100%
PURCHASE ORDER



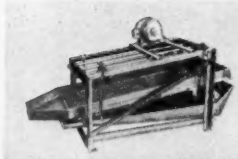
THING FOR EVERY PIPING SYSTEM

RANE

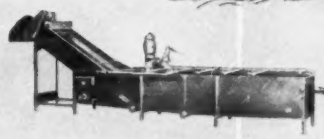
ITTINGS • PIPE • PLUMBING AND HEATING

fmc Washing Equipment
Assures Clean Premium Packs

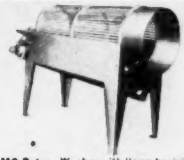
....CANNED OR FROZEN



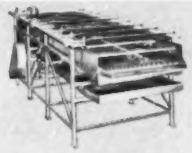
FMC Shaker Washer provides highly effective washing of peas, whole grain corn, beans and other small firm products.



FMC Flood Type Washer floods out all minute particles from spinach and other leafy products.



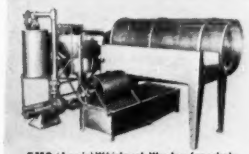
FMC Rotary Washer with "non-bruising" discharge feature rolls and scrubs clean the most tender product without damage.



FMC Shaker Fruit Washer employs a gentle scrubbing and rinsing action for best results in cleaning whole fruits.

FMC Model 15 Washer combines tank and jet spray principles for most effective washing of tomatoes, beets, apples, etc.

FMC Ear Corn Brusher thoroughly removes silk and dirt from ears for whole grain, cream style or corn on the cob.



FMC (Lewis) Whirlpool Washer for whole grain corn, peas, etc., efficiently washes out foreign material.

FMC Rotary Wire Cylinder Washer turns vegetables gently over and over, exposing all parts to fine sheet spray.

FMC Rotary Rod Washer for hard root vegetables is used extensively as a pre-washer prior to steam peeling.

FMC Peerless Corn Washer gently tumbles, rubs and scrubs ear corn clean at an amazing capacity.

Regardless of product, a premium pack must be thoroughly cleansed before canning or freezing. A great many products, moreover, require a special technique in the cleaning process. Only with well designed, specialized equipment can the highest standards of cleanliness be maintained. Intensive research, field testing, and engineering development lie behind FMC's solution to each of these problems. The result is a complete line of equipment, typified by the illustrations above. Each machine is proved for its specific job. For a clean pack—a premium pack with a profit—you can rely on the efficiency, productive capacity, and reliability of FMC washing equipment.

Write for full information on FMC Washing Equipment, or call your nearest FMC representative.

First in Diversified Food Equipment

FOOD MACHINERY AND CHEMICAL CORPORATION
Canning Machinery Divisions
General Sales Offices:
EASTERN: HOOPESTON, ILLINOIS **WESTERN:** SAN JOSE 5, CALIFORNIA

TODAY'S ONLY TRULY MODERN TRUCK

Delivers more . . . at lower cost

Ralston Purina Company has used Whites throughout the country for years. Here is its newest White—a Model 3022 six-wheeler.

FIND OUT FOR YOURSELF how this great new White 3000 *costs less . . . earns more* because it is completely engineered for greater work capacity—greater usefulness—in *your* business. The exclusive advantages of its functional design result in extra body capacity, greatly improved maneuverability, new safety features, reduced maintenance cost and real time and energy savings for the driver.

Today's only truly modern truck brings new distribution efficiency to your business. Ask your White Representative for a demonstration of its time and cost-saving advantages.

THE WHITE MOTOR COMPANY • *Cleveland 1, Ohio*

The Great White Line includes White Super Power, Diesel Power and 3000 Models for city-suburban delivery, over-the-road service and construction and off-the-road operation.

FOR MORE THAN 50 YEARS THE GREATEST NAME IN TRUCKS

You can get some bright ideas in almost any good Restaurant

YOU'LL encounter stainless steel before you even get inside many a restaurant these days—on the marquee, building-front, sign or show window. There's a lot more in the dining-room—on the tables, the serving-stands, and in decorative notes. And back in the kitchens there's a veritable blaze of shining stainless steel . . . utensils, cabinets, work surfaces, ovens, mixers, walk-in refrigerators, washing machines—almost everything you see, everywhere you look.

Now, why? Because the chefs like it? Yes, partly. But mostly because restaurant and hotel men are good businessmen—*and Allegheny Metal is good business!* No other metal commercially available today is as hard, strong and resistant to corrosion, heat and wear as stainless steel. In the long run, no other metal cleans as easily, quickly and cheaply—gives as lasting service and stays as good-looking.

Those are values that can make you a profit, too. Wherever you see bright Allegheny Stainless, there's a possible bright idea waiting for you . . . and we're ready to help you work it out.

* * * * *

Complete technical and fabricating data—engineering help, too—are yours for the asking from Allegheny Ludlum Steel Corporation, Pittsburgh, Pa. . . . the nation's leading producer of stainless steel in all forms. Branch Offices are located in principal cities, coast to coast, and Warehouse Stocks of Allegheny Stainless Steel are carried by all Joseph T. Ryerson & Son, Inc. plants.

WAD 3114

You can make it **BETTER** with

Allegheny Metal

AL
TIME-TESTED STAINLESS STEEL

WORTHINGTON REFRIGERATION REPORT

WORTHINGTON PUMP AND MACHINERY CORPORATION
HARRISON, NEW JERSEY

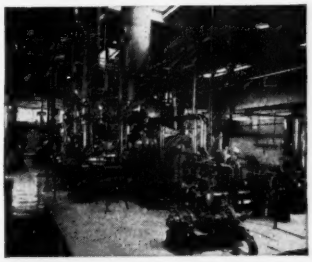
Specialists in air conditioning and refrigeration for more than 50 years

Ice-Making Fuel Cost Reduced by 40%

The Pacific Fruit Express Co. has an ice manufacturing and storage plant at Tucson, Ariz. for servicing perishable produce shipped by rail. This plant operates 24 hours per day and has a capacity of 250 tons daily during the peak season. They can ice 160 cars, 80 on each side of the platform in one spot.

The Worthington LTC-4 Gas Engine-driven Compressor installed at this plant is more economical than the steam-driven compressor it replaced, having reduced fuel cost by 40%.

The Worthington Compressor was installed in April, 1948, and is used for recirculation of ammonia gas in refrigeration plant. This 500 hp, 300 rpm machine runs an average of seven months per year, 24 hours per day and has given trouble-free operation.



Main engine floor showing Worthington LTC-4 Ammonia Compressor driven by a Worthington gas engine.

Nothing Too Good for the Pigs

John Morrell & Co.—one of the largest pork meat producers in the world—has always been alert to technical progress. It was the first to wrap hams in parchment paper, first to pack lard in paper cartons, one of the first to install the revolving smokehouse.

When the company decided to increase the general refrigeration capacity of its plant at Ottumwa, Iowa, Worthington equipment was selected on the basis of favorable comparative operating cost figures.

That was over ten years ago, and the Worthington two-stage ammonia compressor is still operating in a highly satisfactory manner, in respect both to operating cost and absence of trouble.

Cold storage room at John Morrell & Co.'s Ottumwa plant.

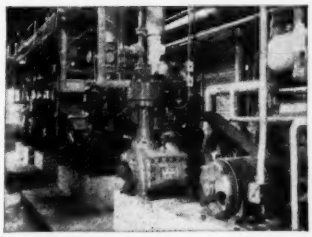
This compressor operates 24 hours a day with shutdown only during the coldest month for annual overhaul. It provides refrigeration for both freezing and storage (0 to 15 F).

Fully Automatic Refrigeration for First National Stores

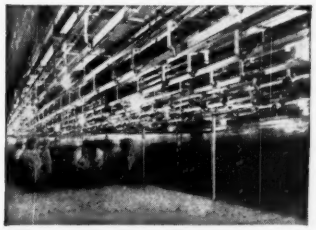
About 300 stores of the vast northeastern network of First National Stores are served by the warehouse in East Hartford, Conn.

This warehouse has recently been expanded by the construction of refrigerated compartments for banana ripening, meat storage and assembly, and cooling of pork products, corned beef and chicken.

A fully automatic system of refrigeration has been installed. It produces about 80 tons of refrigeration, and includes the following Worthington equipment: four 7 x 7 ammonia compressors, two 16 x 12 condensers, one 12 x 9 condenser, two 16 x 16 brine coolers, one 12 x 9 brine cooler.



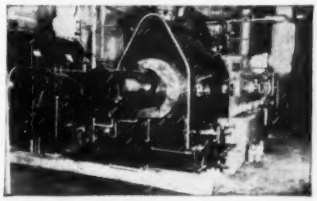
Four Worthington 7 x 7 VSA ammonia compressors. Condensers in background, brine coolers overhead.



Meat storage room—part of new addition to East Hartford warehouse of First National Stores.

There are two levels of brine refrigeration, one at minus 15 F, one at 12 F. Defrosting is done by hot brine in rooms served by pipe coils and by water in rooms served by product coolers.

Architect: Ganteaume and McMullen, Boston. Installation by Harding and Gross, Cambridge.



Type ODU Uniflo steam-driven Worthington ammonia compressor.

WORTHINGTON

AIR CONDITIONING AND REFRIGERATION

A complete line . . . in which *all* the vital components are *made*, not just assembled by Worthington. For more worth with Worthington, see your nearby Worthington distributor (consult Classified Telephone Directory).

New Packages and Products

Pack 18 Gum Sticks **A**

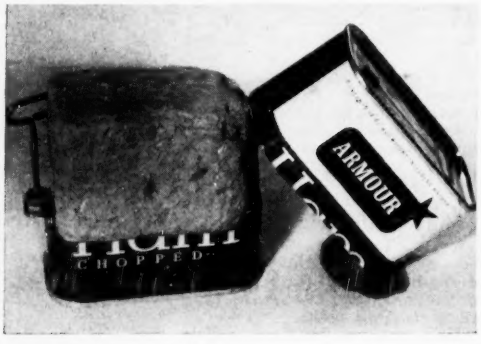
Bigger unit sales, also extra freshness due to heat-sealed foil-wax laminated overwrap are results of 18-stick rip-tape gum package. (Wm. Wrigley, Jr. & Co., Chicago)

"Diamond"-Shaped Tin **B**

Eye-catching is this rhomboid pack containing biscuits for caviar or meat. Inner foil seal, cellophane wrap keeps 'em fresh. (J. P. Ritz Ltd., Laupen-Berne, Switzerland)

Handy Beer Carrier **C**

Three-can Karry Kit ups unit sales, stores flat or standing. Inset: Cardboard tabs hold end cans' rims (P. Ballantine & Sons, Newark, N. J)



Ham Tin Opens at Middle **D**

Ham loaf can be removed easily from middle-opening tin. Consumers appreciate extra convenience. (Armour and Company, Chicago)

Frozen Salmon Cutlets in Tin **E**

Consumer acceptance of its new product—fresh-frozen salmon cutlets packed under the Polar label—is now being tested by Pacific American Fisheries, Bellingham, Wash.

Skinless and boneless cutlets are vacuum-packed in a 1-lb. flat salmon can, believed to be the first use of tin in the frozen food field. Two cutlets, each 1 in. thick, are separated by a waxed cardboard disk. Can is packed in a cellophane carton intended to identify the product as frozen rather than canned.

Labels on both can and carton warn that the product has not been cooked.

Time-Saving Bread Mix **F**

Now being locally marketed in the Philadelphia vicinity is a product called Dehydrated Sponge Bread & Roll Mix, stated to save housewife time in baking bread and rolls. All she has to do is add hot water, knead makeup into bread or rolls at once, let rise to double size in pans, then bake. The usual first rise is eliminated, no yeast has to be added to the dough.

The maker, Bat-O-Lite Co., Philadelphia, packages its product in 1¼- and 5-lb. cartons. Directions for making rolls, bread, coffee cake, pie and noodles are given on package.

Mix is prepared like an old-fashioned loaf of bread. A sponge is formed, fermented for several hours, cut up, and dried. Then it is pulverized back into flour form. Patents are pending in this country, Canada and Great Britain. Marketing is still in early stage.

Want *More* Information?

It's free—and easy to get. Say, for instance, you want added details on the item marked "B" here on page 112. Just turn to one of the special Reader Service postcards inside the front cover and circle the 112B. Sign at the bottom and mail—no stamp needed. Then the extra information will be on its way to you.

The mark of competent glass engineering

Armstrong Engineers are responsible for many improvements in container design to meet technological advances in packaging equipment developed to speed filling and sealing. These modifications include redesign of finish, neck, and base contours, many of which have been adopted by the glass industry. Competent engineering is one of the many reasons why users of glass containers have come to associate the name Armstrong with improved performance. Let your Armstrong representative show you how to better your production records with quality containers or write to Armstrong Cork Company, Glass and Closure Division, 4208 Prince Street, Lancaster, Pa.

ARMSTRONG'S GLASS

PECTINOLS *Make Fruit Products LOOK as Good as They TASTE*

PECTINOLS bring to your fruit products eye-inviting clarity, while retaining taste-tempting flavor. Regardless of the product or the process, when PECTINOLS go in, cloudy sediment comes out—*fast!* Your beverages, concentrates, syrups or spreads *look* as good as they taste.

You need no special equipment to use PECTINOLS. Just add these special enzymes to pressed juices or mashed fruits, give them a few hours to break down pectic substances, then filter your product clear of sludge and cloudy material. Easy. Inexpensive. Effective.

PECTINOLS are used for:

Clarification of Fruit Juices
Clarification of Frozen Fruit Juice Concentrates
Clarification of Wines
Production of Vinegar
Production of Fountain Syrups
Production of Flavor Extracts
Production of Jellies

PECTINOLS are effective on:

Apples, Grapes, Citrus Fruits
Cherries, Pears, Peaches
Blackberries, Strawberries
Raspberries, Elderberries, Dates
Loganberries, Papaya, Rhubarb

You'll also find PECTINOLS used on fruit and vegetable wastes to recover valuable solids and readily dried presscakes.

OTHER INDUSTRIAL ENZYMES TO IMPROVE YOUR PROCESSING

Enzyme System	Designation	Availability	Action on Substrate
Pectinolytic	PECTINOL	Commercial	Demethoxylates pectic substances and hydrolyzes them to galacturonic acid. pH range 3.5 - 5.
	Pectin esterase	Experimental	Demethoxylates pectin without hydrolysis of the galacturonic acid chain. pH range 3.5 - 5.
Proteolytic	RHOZYME P-11	Commercial	Hydrolyze proteins to peptides and amino acids. pH ranges 5.5 - 8.5. (Relative amounts of peptides and amino acids will differ for each proteolytic enzyme.)
	Protease 15	Experimental	
	Protease 16	Experimental	
Amylolytic	RHOZYME S	Commercial	Hydrolysis of starch to dextrins, maltose and glucose. Contain both an alpha amylase and a strong glucogenic principle. pH range 5-6. RHOZYME S is a purified enzyme; RHOZYME T-22 the crude product.
	RHOZYME T-22	Commercial	
	RHOZYME DX	Commercial	Hydrolysis of starch to dextrins. Heat stable. pH range 5.5-6.5.
Lactase	Lactase A	Experimental	Hydrolysis of lactose to glucose and galactose. pH range 6.1 - 7.5.

For full information regarding PECTINOLS, write to:

For the State of California:
A. R. Zacher Company, Inc.
434 P Street
Fresno, California

For Washington and Oregon:
Duncan Equipment Company
1907 - 4th Avenue, South
Seattle 5, Washington

All other inquiries to Philadelphia office. Write us about your problems and ideas. We'll be glad to send you our suggestions, samples, technical literature concerning *any* Rohm & Haas industrial enzymes—or consult with you personally, all without obligation.

CHEMICALS FOR INDUSTRY

ROHM & HAAS COMPANY

WASHINGTON SQUARE, PHILADELPHIA 5, PA.

Representatives in principal foreign countries

PECTINOL and RHOZYME *are trade-marks, Reg. U.S. Pat. Off. and in principal foreign countries.*

New "Oleo" Packages Conform to Regulations A-B

Restyled according to federal labeling regulations, these margarine packages were introduced upon removal of the 10c.-a-lb. federal tax July 1. Durkee Famous Foods, Cleveland, added this new 1-lb. "Eastern Flat" (left photo, A) to its line, while redesigning its "Western Flat" and "Elgin Square." All three feature view-the-product windows. Package consists of parchment inner-wrapper around each ¼-lb. print in a paraffined carton overwrapped in cellophane. Red and blue letters are on a yellow background, and the bottom panel has white letters on blue background.

The Good Luck Products Div., Lever Bros. Co., introduced a new margarine made by a special process in addition to revamping its package (right photo, B) at its Hammond, Ind., plant. Package is green and yellow, with the four quarters of margarine wrapped in aluminum foil.

Observers feel that the two maragarine makers have done a good job in revamping their packages, considering handicaps imposed by regulations.

Mustard in Tubes C

Sold in France for years, tubes of mustard have now been introduced to American housewives by a Paris firm. Five types, including pictured White Dijon, the strongest flavored, Tarragon, and Green Herbs, the weakest—are being marketed.

Possibilities of successfully packaging food in tubes have received renewed attention of late, therefore U. S. firms will watch the housewives' reaction to the mustard.

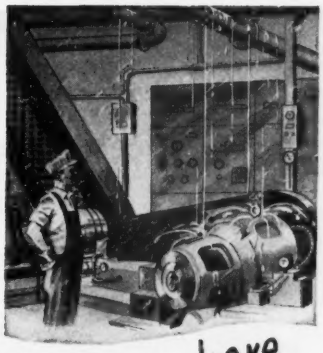
The processor, Maille S. A., 16 Rue Davial, Paris, uses an aluminum tube holding 3½ fl. oz. Lining is plastic; label is lithographed. Colors of the three different labels approximate colors of the mustards inside, the Dijon being packaged in a yellow tube, Tarragon in brown, and Green Herbs in green.

Package Sliced Spuds D

Sliced potatoes, ready for French frying, are going over in the St. Louis area, according to Kaufman Lunch Co., producers of the item.

The slices are packaged in heat-sealed cellophane bags. Present output is 2,400 bags a day, but television promotion is seen increasing sales.

The company's 50-ft. processing line includes a horizontal abrasive potato peeler, an inspection and sorting table, cutter, soaking tank, and a shaker conveyor belt. A converted potato



Moisture here costs money!

. . . at the South District Chicago Filter Plant, it did just that. Electrical insulation broke down—electrical control equipment functioned erratically. The excessive moisture condensation corroded pipes, made unhealthy and uncomfortable working conditions. The application of KATHABAR system of humidity control for comfort and process atmospheres, in the pump room, removed the excessive moisture—proved conclusively that it would pay for itself in a short time by reducing maintenance and replacement costs, while providing comfortable working conditions. The same kind of moisture control is applicable to all types of underground mechanical and hydraulic equipment in breweries, coffer dams, mines, and other similar fields.

Write for the complete story and learn how KATHABAR can help you meet your production requirements.

The *Kathabar* system of humidity control for industrial processes and comfort offers you:

★ *FLEXIBLE OPERATION*—Prescribed humidity level maintained regardless of outside conditions—humidifies as well as dehumidifies.

★ *DEPENDABILITY*—Few moving parts—system serviced while in operation—non-corrosive solution.

★ *EASE OF INSTALLATION*—Simple duct arrangement—compact and lightweight—minimum assembly required.

★ *ECONOMY*—Extra low operating cost—needs no licensed engineer.

PREVENTS FROST ON LOW TEMPERATURE COILS

Kathabar

MANUFACTURED BY
Surface Combustion
CORPORATION
TOLEDO 1, OHIO

SURFACE COMBUSTION CORPORATION
Kathabar Division
TOLEDO 1, OHIO
Please send Chicago Filter Plant story to:
Name _____
Address _____
City _____
Zone _____ State _____

The NEW CLARK Electric

TRUCLOADER 1000-lb. Fork Truck

Here are the Reasons Why:

This machine embodies every desirable feature that experienced users have requested. It is the nearest approach yet to the ideal electric 1000-lb. fork-lift truck.

★ Automatic Acceleration Automatically accelerated control is standard. First power point selected by directional control lever on steering column—successive points controlled through master switch which in turn is controlled by an automatic timer. Guarantees even acceleration.

★ Non-Plugging Controls Impossible to change direction until motor comes to full stop. Important safeguard to windings and other vital components.

★ "Deadman" Safety Brake Brake sets automatically when the driver leaves seat; releases when seat is occupied. Combination parking brake and safety feature. Independent of service brake. Directional control lever also automatically *locks in neutral* when driver leaves seat.

★ Independent Hydraulic System—Separate motor increases lifting and tilting speeds about 80 per cent—gives drive motor big efficiency boost. Directional lift lever: pulled upward, it raises the forks; pushed downward, it lowers them.

★ Greater Capacity Increased lift capacity and speed; increased travel speed. Simplified driving—finger-tip control; non-kick-back steering.

★ Easy To Service Battery-compartment cover hinged at front for easy access—plug-receptacle conveniently mounted. All grease fittings within easy reach.

You'll want full information on this new "BEST BUY" in the entire field of Materials Handling. Get in touch with your nearby Clark dealer—you'll find him a capable counselor on your handling problems. The coupon is for your convenience—no obligation.

CLARK ELECTRIC AND GAS POWERED FORK TRUCKS AND INDUSTRIAL TOWING TRACTORS

INDUSTRIAL TRUCK DIVISION • CLARK EQUIPMENT COMPANY • BATTLE CREEK 14, MICH.

Please send: ☐ Elec.-Truckloader Literature ☐ Movie Digest ☐ Material Handling News

Name_____

Firm Name_____

Street_____

City_____ Zone____ State_____

AUTHORIZED CLARK INDUSTRIAL TRUCK PARTS AND SERVICE STATIONS IN STRATEGIC LOCATIONS

chip filler is reported serving as an efficient filling machine on the packaging line. Filled packages are weighed and finally heat-sealed. •

Canned Vegetable Salad A

A complete vegetable salad in a can has been added to the Butter Kernel line of foods packed by Minnesota Consolidated Canneries, Minneapolis. The ready-to-serve salad contains green beans, carrots, celery, peas, kidney beans, pimientos and sweet pickles marinated in seasoning and vinegar. If the housewife desires, she may use the mix in making her tossed salad, or she may employ it with gelatine as a molded salad.

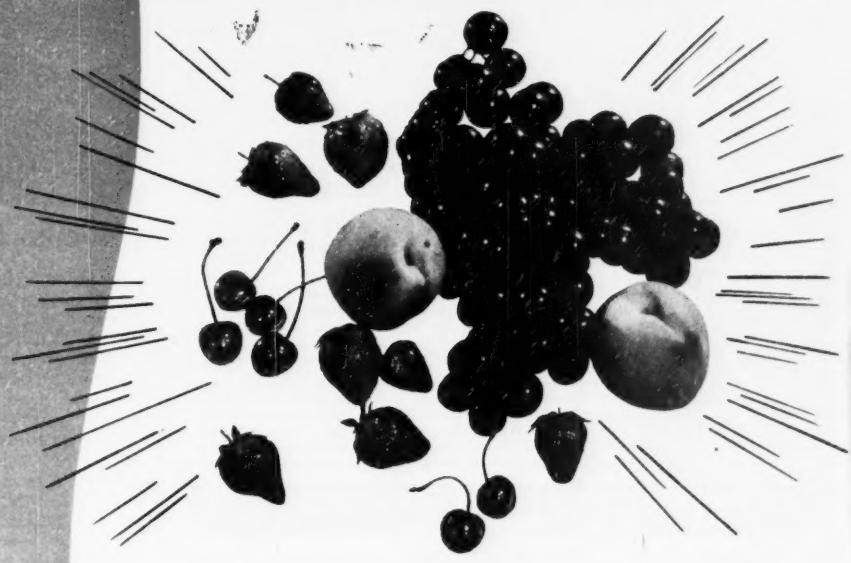
The blue and white can comes in two sizes—15 oz. for 4-5 servings and 8 oz. for 2 or 3.

B-and-S Bread B

Pepperidge Farms, Norwalk, Conn., recently began marketing brown and serve French bread, and good initial success is reported. This is first time the b-and-s principle has been applied to bread.

Two loaves of bread, total weight 9 oz., are attractively packaged in a cellophane-windowed blue open-flap carton. Each loaf is sized to be finished by a small family at one meal. Method

THERE *IS* SOMETHING NEW



IN *TRUE FRUIT* FLAVORS!

By adopting and improving on the new discoveries in fruit concentration WITHOUT THE USE OF FLAVOR KILLING HEAT, the ALVA laboratories now offer True Fruit flavors containing a considerably higher percentage of the fugitive volatile essences so vital to the fresh, true flavor of natural fruits.

Normally lost in distillation, these essences are initially captured and ultimately returned to the concentrate in the unusual equipment built by ALVA technicians. The result is a concentrate that is fresher, possesses more body and will go further in natural flavoring.

This remarkable technique is now standard in the production of ALVA True Fruits.

There's a difference . . . All the flavor is there . . . We'll send you samples for comparison.

Write for your copy of the complete ALVA Flavors Catalog

VAN AMERINGEN-HAEBLER, INC.
521 WEST 57th STREET, NEW YORK 19, N. Y.

Alva FLAVORS

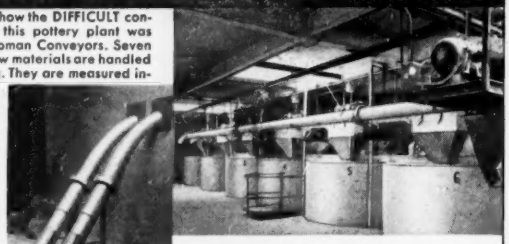
HAPMAN

TUBULAR CHAIN OR CABLE CONVEYORS

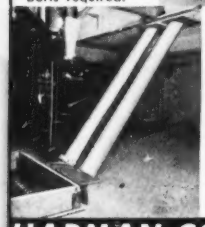
FOR FLOWABLE MATERIALS

U.S. Pats. & Pats. Pend.

These photos show how the DIFFICULT conveyor problem at this pottery plant was best solved by Hapman Conveyors. Seven kinds of ceramic raw materials are handled without intermixing. They are measured into hopper in lower photo and carried on 2 planes up 2 floors into Blunger room. Positive-discharge Hapman Vibrators used with rotary valves insure accurate volumetric discharge into any one of the 6 Blungers. Note small wall and floor openings and the minimum supports required.



SOLVED! A DIFFICULT CONVEYING PROBLEM



Here one conveyor must handle and keep segregated 7 types of material. The conveyor must be dust-tight and operate in more than one plane and direction without transfer points. There is only limited space for clearance and supports. Only Hapman Rubber-Flight Chain Conveyor was able to meet all these DIFFICULT requirements at the budgeted cost.

When confronted with *difficult* conveying problems, you'll probably find the answer in Hapman Conveyors. They are handling most types of flowable materials under one or more of the 45 *difficult* conditions which only completely "job-engineered" Hapman Conveyors meet successfully. Send for the Hapman catalog showing these materials and the methods used to handle them.

HAPMAN CONVEYORS, Div. 1920-a W. DAVISON DETROIT 23, MICH.

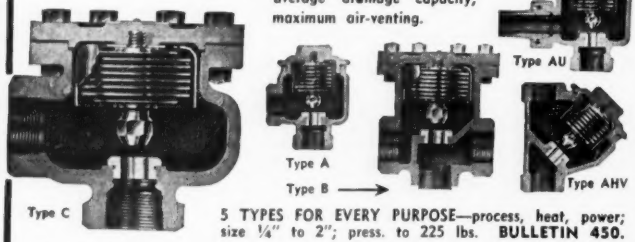
HAPMAN-DUTTON COMPANY

Well-Known Processor

Puts 37% More Thru Cookers

with Nicholson Steam Traps

A leading drug manufacturer found that a recent Nicholson thermostatic steam trap installation, replacing a mechanical type, so cut kettle time that their production was increased 37%. Reasons for Nicholson's faster heat transfer: operate on lowest temperature differential; 2 to 6 times average drainage capacity; maximum air-venting.



5 TYPES FOR EVERY PURPOSE—process, heat, power; size ¼" to 2"; press. to 225 lbs. **BULLETIN 450.**

HIGH-PRESSURE FLOATS—Stainless, monel, steel or plated steel. Welded. In all sizes and shapes; for operating mechanisms and as tanks or vessels. 2-day delivery. BULLETIN 348.

W. H. NICHOLSON & CO.

193 Oregon St., Wilkes-Barre, Pa.

of browning is same as for rolls—just place in oven.

Maker points out that finished-baked French bread tends to harden after 6 hours. The brown and serve variety overcomes that difficulty.

Short-Order Beans A

Precooked white Navy beans, also known as pea beans, are offered by J. Richard Phillips, Jr., & Sons, Berlin, Md. If housewife wants soup, all she does is add water and heat. Otherwise for a baked bean dish, contents of 20-oz. can gives her a cooked bean stock.

Pork and a brine solution are mixed with the New York pea beans prior to canning. Then goods are hermetically sealed in #2 can and cooked for 1½ hr. Very little free juice results. Except for salt, no sauce or spice is added. The pork flavor mildly penetrates contents of the can.

Item is seen of value as short order dish in restaurants and hotels.

Package & Product Shorts

Import Tyrolean Wines B

Four kinds of Italian wines, made from Tyrolean wine grapes, are being imported for first time since prior to World War II by Zenith Wine Co., New York. Aged since 1944, following wines are available. Terlaner, Riesling, Kalterer See, and St. Magdalena.

Strained Tuna for Babies C

Featuring high protein content, strained tuna for infants is being marketed by Van Camp Laboratories, Terminal Island, Calif. It's sold under both White Star and Chicken of Sea brands.

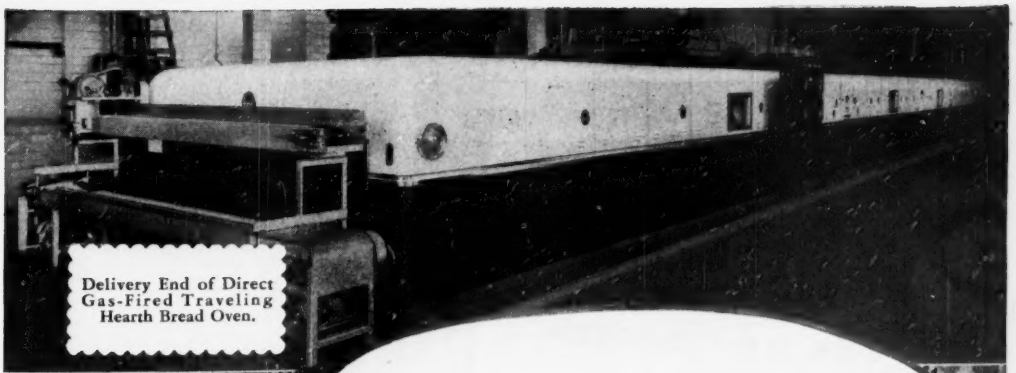
Frozen Suckers D

Combination package of flavoring and wooden sticks is offered for home-freezing of fruit-flavor suckers. The Julep Co., Chicago, has put up a flavoring which when mixed with sugar and water, then frozen, provides a cool summer treat. Sherbet can also be made from the flavoring.

Non-Caloric Sweetening Agent E

A synthetic sweetener, Sucaryl Sodium, that is non-caloric but still can be used for cooking, baking and canning without loss of sweetness, has been announced by Abbott Laboratories, North Chicago. Having good heat stability, the sweetener is made from sodium cyclohexyl sulfamate.

—*End*



Delivery End of Direct Gas-Fired Traveling Hearth Bread Oven.

VARIETY BREAD-BAKING OPERATIONS AT GENERAL BAKING COMPANY EMPHASIZE FLEXIBILITY OF MODERN GAS OVENS

OPERATING FLEXIBILITY, essential in the maintenance of bakery schedules, is obtained by General Baking Company with its modern Gas-fired AMF Traveling Hearth Oven in the Richmond, Virginia, Bond Bakery.

With a production capacity exceeding 4000 loaves per hour, this four-zone Gas Oven is used for two types of Bond Bread, as well as for baking whole wheat, cracked wheat, and rye types. Automatic controls maintain the proper temperature in each zone and the Gas-firing system is so effective that the oven preheats in less than an hour.

Equipped with automatic loader and continuous discharge conveyor, this modern traveling hearth oven operates at maximum fuel efficiency because sensitive controls maintain precise temperatures according to the heat demand in each zone. This extreme flexibility is typical of modern Gas-fired Bake Ovens, the type of service you may expect from GAS in baking operations. Call your Gas Company Representative for details.

Photos Courtesy American Machine & Foundry Company, New York and New Haven, Mfrs. of Ovens and Bakery Equipment.

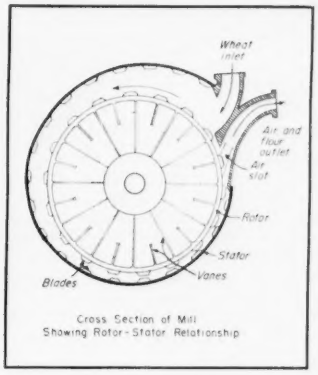
View of Feed End shows portion of the automatic loader on this 100-foot long oven.

MORE AND MORE... THE TREND IS TO GAS FOR ALL COMMERCIAL BAKING

AMERICAN GAS ASSOCIATION 420 LEXINGTON AVENUE, NEW YORK 17, N.Y.

NOW
MILLED
WHITE RICE
CAN MEET MODERN
NUTRITIONAL DEMANDS
No longer need milled white rice be branded as a nutritionally inferior food. The greatest nutritional experiment* of all time, involving 100,000 people, has demonstrated the practicability and ease of adding lacking vitamins and minerals by means of a specially made "premix."
The addition is accomplished by making 1 particle of "premix" the vehicle for enough vitamins and minerals to impart desired minimum levels for 200 particles of the final product. This 1 premix particle is added to 199 particles of regular milled white rice by a simple mechanical feeder.
Vitamin enriching premixes are commonly used by wheat flour millers, corn millers and manufacturers of macaroni products. However, the popular practice of washing or rinsing rice before cooking renders the usual type of premix useless since the vitamin content dissolves in the water and is lost. As a leader in world production of vitamins, Hoffmann-La Roche looked for a means of hurdling this problem, found it, and has made it available to the rice milling industry. The Hoffmann-La Roche method of improvement is covered by U.S. patents #2,381,-342, #2,381,343 and #2,475,133. Rice Enrichment, Inc., of New Orleans has been licensed to manufacture and distribute premix. For further information write to our Vitamin Division.
*The experiment is under the joint auspices of the Williams-Waterman Fund, Republic of the Philippines Department of Health, United States Public Health Service Rehabilitation Program, National Rice and Corn Corporation of the Philippines and Hoffmann-La Roche Inc. Preliminary reports published thus far have appeared in the Journal of Nutrition of August 1949, Journal of the Philippine Medical Association, November 1949, and the Rice Journal of April, 1950.
ROCHE
Vitamins for Enrichment
VITAMIN DIVISION
HOFFMANN-LA ROCHE, INC. • NUTLEY 10, N. J.
FORTIFIED LONG GRAIN
FORTIFIED MEDIUM GRAIN
FORTIFIED PEARL

New Technology



Cross Section of Mill Showing Rotor-Stator Relationship

Finer Grind, Improved Quality Whole Wheat Flour Produced by High-Speed, Rotary-Type Mill

Comprising a rotor turning in a drum-shaped stator, the working surfaces of each consisting of serrated steel blades, an experimental high-speed rotary flour mill has been developed that grinds the entire wheat berry into exceedingly fine flour in one passage through the mill. The rotor is eccentrically mounted in the stator, with minimum clearance between the two at a point near the outlet. Rotation is in the direction of decreasing clearance between the blades of rotor and stator. Flour is removed from the mill by a blast of air produced by fan blades on the rotor, and collected in a cloth bag from which it is shaken into a suitable container. Ultimate grinding capacity is not known, but the experimental mill showed no evidence of overloading when grinding at a rate of 279 lb. per hr. The name "Unifine" has been coined to describe the product because it contains the entire wheat berry ground to a high degree of uniformity and fineness in comparison with whole-wheat flour.

Extensive baking tests have been made to develop a satisfactory bread formula for Unifine flour, and to compare different grinds of Unifine, patent, and whole-wheat flours. The following formula gave loaves of good volume, uniformity, texture, and flavor: In grams, flour 200, milk solids 16, sugar 20, salt 4, fat 4, and yeast 6.5. To this mixture was added 165 ml. water. Fermentation time and proofing were each 1½ hr., and baking time 35 min. at 350 F.

Three tests were conducted to determine consumer reaction to the new bread: Two at student cafeterias and one through the regular distribution of a commercial bakery. Although of limited scope and duration, the tests indicated that the bread was acceptable to the groups tested, namely, college men and women, and customers on delivery routes of a commercial bakery.

Digest from "Unifine Flour: Milling, Baking, and Consumer Acceptance Tests," *Bulletin* No. 206, April 1950, Washington State Institute of Technology, State College of Washington, Pullman, Wash.

DAIRY

Milk Pasteurized After Bottling

Reversing the usual procedure of first pasteurizing and then bottling raw milk, a patented process proposes to bottle the milk and then subject the sealed bottles to heat treatment. The method is designed to overcome the objection that contamination can and does occur in the former method during cooling and bottling.

In detail, raw milk is filtered, bottled and capped, and placed in crates which are packed in a cradle. The latter is immersed in a tank of water heated to 152-155 F., where it remains for 30 min. It is then transferred to a conditioning chamber where the bottles are air-cooled for a few minutes. Further cooling is accomplished by immersion in a tank of water at a temperature of 85 to 90 F. for 20 min., followed by final chilling in water at 40 to 50 F. for 15 min. The milk is then ready for delivery to the consumer.

Digest from U. S. Patents 2,493,663-4, issued Jan. 3, 1950, on applications dated Dec. 22, 1945 and March 26, 1947, respectively, to James O. Fowler, Sparkhill, Birmingham, England.

Esters Improve Ice Cream

Improvement in the manufacture of ice cream, recently patented, relates to certain additives to the mix which produce a drier product of better texture and body than heretofore attainable, with greater overrun in a shorter time than has been possible with known stabilizing agents or compositions. The inventor has discovered that the whipping quality of ice cream mixes can be improved by adding to the stabilizer (alginate, gelatin, or carboxymethyl cellulose) a small quantity of a surface-active agent, such as one of the polyoxyethylene derivatives of stearic acid. The additive is prepared by mixing the stabilizer and surface-active agent with a third component, referred to as a drying agent, which aids the dispersion of the additive through the liquid. The drying agent may be dextrin, milk sugar, or sucrose. One of the functions of the ester, or surface-active agent, is to emulsify the butterfat in the ice cream composition. Formula are given for various compositions of

INDEX TO ABSTRACTS

CEREALS
Finer Grind, Improved Quality Whole Wheat Flour 121

DAIRY
Milk Pasteurized After Bottling 121
Esters Improve Ice Cream 121

CANNING
Preservation With Antibiotics 122

VITAMINS
Vitamin E Oil From Wheat Germ 122

FRUITS AND VEGETABLES
Uniform Color to French-Fries 122
Flotation Process Clarifies Pineapple Cannery Waste 123

MEATS AND FISH
Inhibiting Rancidity in Fish Oils 123
Bacteria in Sausage 124

BEVERAGES
Taste Testing Beer 124
Loss of Bitter Substances During Brewing Process 125

MISCELLANEOUS
Gas Treatment Inhibits Spoilage Enzymes 126
Multi-Stage Heat Exchange Applied to Wort Cooling 126

Handle **LARGER** Batches

. . . Discharge

AUTOMATICALLY

Now you can do more mixing in less time—with the Worthington-Ransome Rotating-Tilting Pan-Type Mixer.

The drum is not only motor-*rotated* . . . it's also motor-*tilted*. Push-button tilts drum to any angle while rotating —materials discharge *completely*, with no nuisance of scooping.

Capacities up to 3000 lb. reduce handling and re-handling and increase output.

Widely used for coating, coloring, tumbling, polishing and finishing on candies, gum, drug tablets, etc.—mixing powdered milk, relishes, dry gelatin, etc.

Write for Bulletin R-708 on Worthington-Ransome Mixers, built from designs developed from nearly a century of mixer experience.

WORTHINGTON

WORTHINGTON PUMP AND MACHINERY CORP.
RANSOME INDUSTRIAL MIXER DIVISION
DUNELLEN, NEW JERSEY VR.O.4

additives containing stabilizer, ester, and drying agent.

Digest from U. S. Patent 2,493,324, issued Jan. 3, 1950, on an application dated March 3, 1947, to A. B. Steiner and Aaron Miller, La Jolla, Calif., and assigned to Kelco Co., San Diego, Calif.

CANNING

Food Preservation With Antibiotics

A new canning method that is expected to help canners cut their processing costs and improve the flavor and texture of many canned foods may result from experiments conducted at WRRL, Albany, Calif. In the experiments, it was found that canned foods containing botulinum and other food-spoiling organisms could be effectively sterilized at 212 F. or lower when tiny amounts of subtilin were present.

In the laboratory tests, subtilin was dissolved in a weak saline solution before it was added to the cans of vegetables or other foods. A concentration of 20 ppm. was found to be adequate.

Peas, asparagus, corn, green beans, peeled potatoes, precooked rice, fish, chicken, and mushrooms are some of the products that have been preserved satisfactorily. In taste tests, laboratory food experts found little or no difference in flavor between cut corn preserved in this way and corn fresh from the field.

The process also offers a means of preserving such vegetables as broccoli, cauliflower and brussels sprouts, which become mushy and unattractive when processed by usual methods.

The antibiotic is produced in submerged fermentation, by a process similar to that used for penicillin, by a common bacteria, *Bacillus subtilis*.

Digest from "Preservation of Vegetables With Subtilin and Mild Heat," by A. A. Anderson, H. D. Michener and G. S. Bohart, a paper presented at the Decennial Conference, Institute of Food Technologists, Chicago, Ill., May 22, 1950.

VITAMINS

Vitamin E Rich Oil From Wheat Germ

Solvent extraction of wheat germ is used in a patented process for the recovery of oils enriched in vitamin E and sugars enriched in vitamin B. The preferred solvent is an acidulated mixture of ethyl and methyl alcohol containing some water. At boiling temperature this solvent effectually dissolves all of the oil from the wheat germ. On cooling it will throw out of solution a major portion of the extracted oil, but retain a minor portion containing the bulk of the extracted vitamin E. The latter is evaporated under reduced pressure to remove the solvent and leave the oil containing vitamin E as a residue. This residue is suspended in water and centrifuged, yielding aqueous and lipoid phases that are separated by decantation. The liquid phase is pressed to dryness and extracted with acetone to dissolve the sterols and substantially all of the vitamin E. The residue is a good grade of lecithin. The acetone extract is concentrated, and the sterols crystallized out and filtered off. The filtrate is then evaporated to produce a dark red oil rich in vitamin E. The aqueous phase that was separated from the lipoid fraction is evaporated to dryness in vacuum to yield a sugar.

The insoluble material in the original alcoholic extract contains an oil that is separated from the other insolubles by decantation. When this is heated in vacuum it yields a clear oil containing some vitamin E and might be used as a salad oil. The residual insoluble material after decantation of the oil is taken up in hot water, filtered, and evaporated to yield a sugar.

The residual meal from the initial extraction with alcohol consists mainly of starch and protein and still has value as a supplement in human foods and livestock feeds.

Digest from U. S. Patent 2,497,317, issued Feb. 14, 1950, on an application dated June 17, 1947, to W. D. McFarlane, Ste.-Anne-de-Bellevue, Quebec, Canada, assigned to Victory Mills, Ltd., Toronto, Canada.

FRUITS AND VEGETABLES

Process Gives Uniform Color To French-Fried Potatoes

According to recent patent specifications it has been discovered that the depth of browning obtained in French-frying potatoes is dependent on their sugar content, and that uniformity can be obtained by controlling this sugar content, at least in the surface portions of the potatoes. The problem of insufficient or excessive browning is thus minimized in commercial production.

Potato strips prepared for French frying are immersed in hot sugar solution to affect the sugar content of their surface layers. Where the natural sugar content is low, sugar will be absorbed in the surface layers. Where it is high, excessive sugar will be leached from the surface. In a mixture of potatoes of high- and low-sugar content, the hot solution will have a combination effect in establishing substantial uniformity of sugar content in the surface layers.

A variety of mono-, di-, and trisaccharides may be used, but a 1-percent dextrose solution is preferred, maintained at the boiling point. The time of immersion and conditions of frying may be varied to meet different conditions.

Digest from U. S. patent 2,498,024, issued Feb. 21, 1950, on an application dated Aug. 8, 1946, to John L. Baxter, Brunswick, Me.

Flotation Process Clarifies Pineapple Cannery Waste

A patented treatment of pineapple cannery waste makes use of the principles of froth flotation to remove the bulk of suspended solids from the juice prior to filtration. Crux of the invention resides in the discovery that pineapple juice contains a natural frothing agent. If, then, the waste juice is strongly agitated and aerated below the surface, a froth is formed that effectually raises the undesirable solids to the surface where they may be removed. The partly clarified juice is then more easily treated by filtration.

In operation the juice is maintained between the coagulating temperature of albumin and the boiling point of the juice. A preliminary screening may be used to remove the coarser solids. Thereafter the juice passes continuously through a flotation machine in which it is agitated by submerged impellers as air is introduced below the surface. The machine is of standard design except for the inclusion of heating coils to maintain the desired temperature. As the juice flows through the flotation cells, the frothy solids overflow the sides, while the clarified juice passes out at the end. The improvement in filtration brought about by the process is of a high order—100-130 times that of the original juice.

Digest from U. S. Patent 2,496,202, issued Jan. 31, 1950, on an application dated Sept. 4, 1948, to G. M. Eguchi and C. H. Wells, Honolulu, assigned to Hawaiian Pineapple Co., Ltd., Honolulu, T. H.

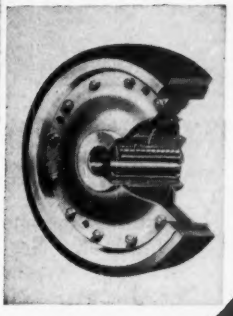
MEATS AND FISH

Inhibiting Rancidity In Fish Oils

Gallic acid esters are good antioxidants for fish oils and certain alkyl gallates protect shark liver oil against loss of vitamin A by oxidation. These were the findings of a wartime research project set up to develop: (1) Effective antioxidants for highly unsaturated oils, and (2) materials which would inhibit decomposition of vitamin A in fish oils.

Gallic acid, which had been reported suitable, was insoluble in oil, but it was found that a partly hydrogenated mix-

DARNELL CASTERS & E-Z ROLL WHEELS



These precision made casters and wheels will help you speed up production . . . will pay for themselves many times over.

Write for Free Manual

DARNELL CORP. LTD. Long Beach 4, Calif.

60 Walker St., New York 13, N. Y.
36 N. Clinton, Chicago 6, Ill.

High-speed end tower EXACT WEIGHT Scales checkweighing quality chicken a la king for quick freezing. College Inn Food Products Co., Chicago, Ill.

Good Packaging Requires Sound Checkweighing . . .

Uniform consumer packages meet every requirement. Net Weight in the package is accurate . . . overweight is eliminated and product recovered . . . underweight does not occur. You meet all weights and measures regulations everywhere. No matter what or how you package, gear your checkweighing to your production line. Do this with weighing equipment that fits the job. EXACT WEIGHT Scales are in daily use in thousands of food plants, coast to coast . . . are designed and built for your particular needs for manually operated, semi-automatic or fully automatic operations. Write for full details for your business.

EXACT WEIGHT Scale Model #213-S, the most popular consumer packaging scale —Features (1) high speed operation due to extremely short platter fall, (1/8") (2) slant end tower construction which takes up less bench space, and permits uninterrupted production across the scale while commodities are being weighed all in direct line of vision, 1 lb. beam, notched type. Dial 1 oz. over and under x ¼ oz. graduation—Capacity to 3 lbs.

EXACT WEIGHT SCALES

Industrial Precision

THE EXACT WEIGHT SCALE COMPANY

21 W. Fifth Ave., Columbus 8, Ohio

2920 Bloor St., W., Toronto 18, Canada

ture (10 percent gallic acid in cottonseed oil) could be added to vegetable and animal oils and exerted a strong antioxidant effect. Therefore, the most promising antioxidants were incorporated into preparations of a similar nature.

Antioxidants were prepared from gallic acid by direct esterification using dry HCl as a catalyst and crystallizing them from suitable solvents. More than a dozen antioxidants were prepared and tested on the following: Soybean oil; body oils of menhaden, pilchard, and salmon; seal blubber oil, and liver oils of dogfish and shark. Results, given in 3 tables and 21 charts, show that, of the special compounds containing gallic acid, KMGP, MCG, KHMD and CMGP are the best antioxidants of those tested, and that KMGP and KHMD gave high protective factors to shark liver oils.

Digest from "Gallic Acid Ester Antioxidants For Fish Oils," by C. D. Bittenbender, *Commercial Fisheries Review*, 1-18, Feb. 1950.

Bacteria In Sausage

Saran plastic casings do not prevent growth of *C. botulinum* in liver sausage. Nor do flavoring constituents when added at ordinary commercial levels.

This was determined in a study of sausage mixtures made with meat containing different combinations of salt, spice and nitrate at levels ordinarily used, and nitrate and additonal salt in other trials.

Mixtures were inoculated with *C. botulinum* (5,000 spores per g.) and stuffed into saran. After cooking, sausage was incubated at 86 F. and tested for toxin after 9, 16, 23 and 30 days. Only sausages containing both nitrate and salt were toxin free in 9 days; but they, too, reacted in 12-23 days. Addition of 200 ppm. nitrate delayed toxin formation; and salt, at 3.5 ppm., prevented its formation for the duration of the tests.

Digest from "Effect of Sausage Constituents on Growth of *Clostridium botulinum* in Liver Sausage Packaged in Saran Plastic Casings," a paper presented by P. K. W. Steinke at 50th General Meeting, The Society of American Bacteriologists, Baltimore, Md., May 17, 1950.

BEVERAGES

Applying Taste Testing To Beer Evaluation

Although tasting tests deal with mixed sensations of taste and scent, and can not be measured quantitatively, they may be conducted in such a manner that statistical analysis is applicable to the results. Several attempts have been made to put beer-tasting on a rational basis.

Helm devised the triangular method of difference-tasting in which three samples of beer are presented to the taster, two of the samples being of the same beer. The taster must decide which one of the three is different from the other two. In this method 6 different orders of 3 samples can be arranged. They are presented to each taster on 4 separate occasions, and the taster must decide whether he can detect any difference, and if so, which samples are identical and which preferred. This procedure yields 24 tasting series, and it has been calculated that if 16 correct answers are given, the probability of this result being arrived at by chance is less than 0.1 percent, so that the result is significant. Analysis of the results of 70 tasters revealed the possibility of grading them for excellence. A few showed up well in all series; others in only one or two.

Opposed to the triangular test is one based on preference-tasting between two samples at a time. Virden contends, however, that if this method is used, and the tasters are asked which of two beers they prefer, the panel must represent the public who are to consume the beer, and that the test should be a drinking test and not just a tasting test.

Miscellaneous factors affecting tasting tests are: Visual conditions that emphasize such qualities as color, clarity, and head; mental disturbances due to noise or other distractions; time of day; and age of tasters. Best time of day is about 10:30 in the morning, and the best age between 30 and 40.

Digest from "Features of Beer-Tasting," by H. J. Bunker, *Food: Processing, Packing, Marketing*, 164-66, May, 1950.

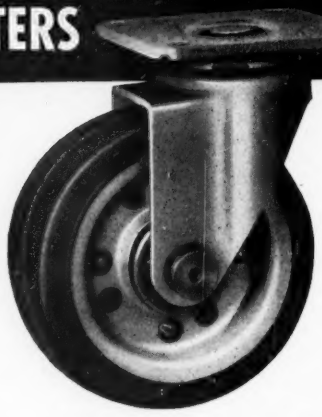
Loss of Bitter Substances During Brewing Process

If boiling of hops is considered a process during which the slightly soluble bitter acids should be converted to bitter substances soluble in beer and possessing the highest possible bittering and preservative value, it can scarcely be considered satisfactory in its present form. For only about 50 percent of the bitter substances can be recovered in an 8 percent extract wort. And in brews of higher extract content even greater losses may be expected. These losses are presumably due to absorption of the bitter substances on precipitated protein that is removed by filtration. During fermentation a further loss of approximately 17 percent is sustained.

Hops appear to be more efficiently utilized when the hopping rate is reduced. Taste tests indicated that where the hopping rate is originally high, reductions up to 20 percent do not ap-

NO OTHER STRAINER
YARWAY
IRON
OFFERS ALL THESE ADVANTAGES
A good strainer protects your equipment and pipelines. Yarway gives you a better strainer to "police your pipelines".
FIRST—The Screen is a high-grade woven monel wire basket that catches solids, lets condensate, oil or other fluids flow freely. Perforated screens if desired.
SECOND—Screen cap is made with straight thread, machined face and spark plug gasket, insuring tight joint. Screen comes out with cap for easy cleaning . . . automatically aligns when replaced.
THIRD—Iron and steel bodies are cadmium-plated for protection against corrosion and for better appearance.
FOURTH—Available in six sizes, from ½" to 2" for pressures to 600 lbs.
FIFTH—Reasonably priced.
SIXTH—Stocked and sold by 150 Mill Supply Houses. Hundreds of thousands already in use. See your local dealer or write for Bulletin S-201.
YARNALL-WARING COMPANY
127 MERMAID AVENUE PHILADELPHIA 18, PA.
YARWAY STRAINERS
"Police the Pipelines"

One of 1458 LOAD-FLOATING WORK-SAVING Colson CASTERS



To meet every need exactly, there are 1458 different kinds of Colson wheels and casters — many of them engineered to meet the special needs of food processing plants. Long notable for quality that has made them the replacement choice of industry, they offer you big dividends in faster handling, easier work and reduced floor damage. It pays you to get the facts. *WRITE TODAY FOR FREE 68 PAGE CATALOG.*

Model No. 3-527-65 swivel fork caster, ideal for use on medium weight industrial equipment. Double row of ball-bearings in hardened raceways; heavy oversize king bolt, patented lock nut. Built for years of rugged service.

THE COLSON CORPORATION
ELYRIA, OHIO
CASTERS • • LIFT JACK SYSTEMS • • INDUSTRIAL TRUCKS

LEE MATERIAL HANDLERS

The Industry's Most Important Development

SAVES TIME, MONEY AND COSTLY MANPOWER

LEE Materials Handler dumping 500 lb., 54 gallon barrel of preserves in 4 ft. high kettles. Other models for specific jobs. Write for Bulletin LM-13.

LEE METAL PRODUCTS CO., INC.
416 PINE STREET, PHILIPSBURG, PA.

ALL LEE KETTLES ARE MADE TO A.S.M.E. CODE

precisably affect the taste of the beer. By prolonging the boiling time, it may even be possible to make a reduction of up to 30 percent of the original hopping rate without changing flavor of the beer perceptibly.

Digest from "The Bitter Substances of Hops in the Production of Beer," by Evald Sandegren, *Wallerstein Laboratories Communications*, 7-15, March, 1950.

MISCELLANEOUS

Gas Treatment Inhibits Spoilage Enzymes

A new process for inhibiting the action of enzymes in meats, green vegetables, fruits and their juices, milk, eggs, and animal fats, has recently been patented. The method involves treatment of food with a gas, the particular constituents of which are CO and C_2H_2. This gas can be produced by burning a fuel gas containing methane, ethane, propane, and butane, yielding a product of combustion substantially free from atmospheric oxygen and containing the two gases mentioned. The initial action of the gas is comparatively rapid, penetrates solid masses of food, and insures a relatively slow reconversion of the enzymes to an active state. Reconversion can be prevented entirely if the cooked or dehydrated food is placed in hermetically sealed gas filled containers, or stored in a freezing unit in an atmosphere of the gas.

Digest from U. S. Patent 2,490,951, issued Dec. 13, 1949, on an application dated March 26, 1948, to M. E. Dunkley, Modesto, Calif.

Multi-Stage Heat Exchange Applied To Wort Cooling

According to a recently patented process for cooling wort through a plurality of stages, the water used in heat-exchange relation with the wort is raised in temperature to a point where it is of value for sparging or other uses within the brewery. City water may be used in the first stage, then utilized to condense refrigerant in a second stage, and after such use employed in a third cooling stage.

Wort passing to the first stage of cooling is at a temperature of about 210 F., and is cooled to about 109. In the second stage it drops to about 80 F., and in the final stage to about 46 deg. F. The water used in the heat exchanger is raised in temperature to about 157 F. which makes it useful for other applications throughout the brewery.

Digest from U. S. Patent 2,495,625, issued Jan. 24, 1950, on an application dated Feb. 5, 1947, to W. S. Bodinus, Chicago, Ill., assigned to Carrier Corp., Syracuse, N. Y.

—*End*

Ask any Dietitian—she'll tell you

"Enriched Foods and Fortified Foods are *Preferred* Foods"

AMERICAN dietitians and nutritionists long ago added their endorsement to the Bread and Flour Enrichment Program. And again they have been proved right by the results of the large-scale Newfoundland Nutrition Surveys.

These authoritative surveys reaffirmed that enriched and fortified foods promote better bodies, *healthier* bodies, sharply reduced infant mortality, lower tuberculosis and over-all death rates—improvement in both the quantity and quality of life.

When you enrich and fortify with Merck Vitamin Products you *know* that the faith of millions of Americans is fully protected. Merck Vitamin Products come from the same organization that pioneered in the research and large-scale development of thiamine, riboflavin, niacin, vitamin C, and other important nutrients. And now, the most recent contribution is thiamine mononitrate, a form of thiamine that has the advantage of greater stability in certain food applications.

With the enrichment program, as well as general food fortification, steadily growing in stature, Merck continues to lead in every distinct, forward step.

Merck Vitamin Products for Enrichment and Fortification

VITAMIN B_1
Thiamine Hydrochloride · Thiamine Mononitrate

RIBOFLAVIN (Vitamin B_2) **NIACIN** (Nicotinic Acid)

ASCORBIC ACID (Vitamin C)

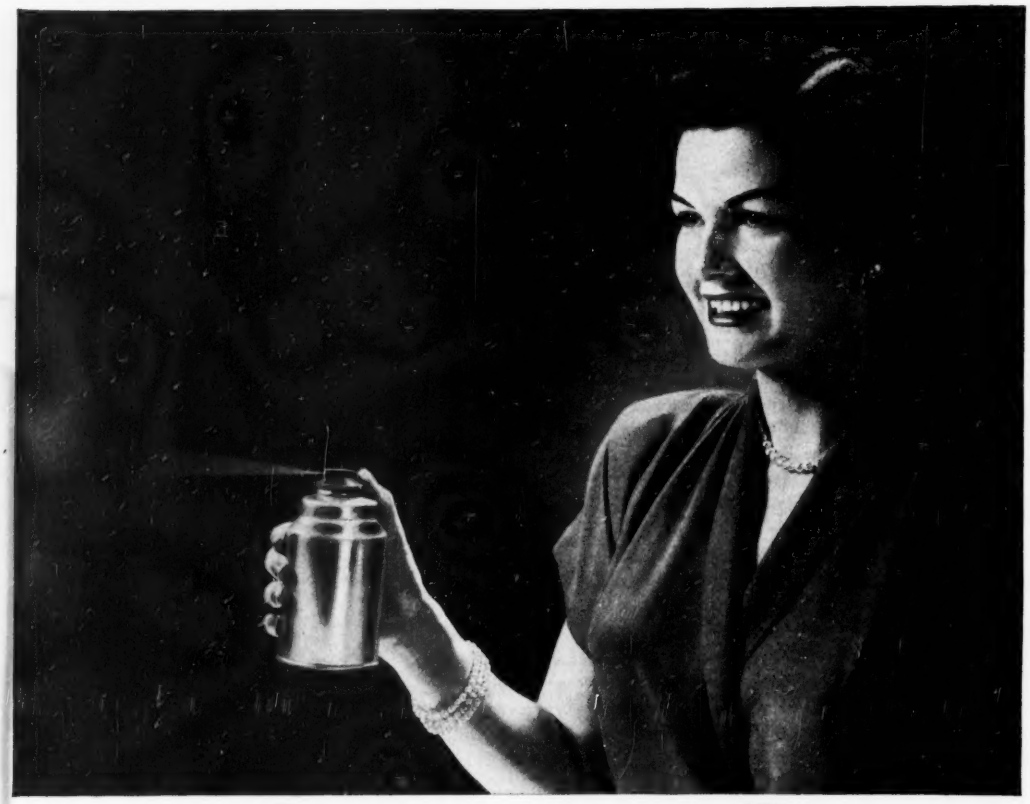
Merck Enrichment Ingredients for Millers, Bakers, Cereal and Macaroni Manufacturers · Merck Vitamin Mixtures for Flour Enrichment · Merck Bread-Enrichment Wafers · Merck Vitamin Mixtures for Corn-Products Enrichment · Merck Vitamin Mixtures and Wafers for Macaroni Enrichment.

Merck Knows Vitamins

MERCK & CO., INC.
Manufacturing Chemists RAHWAY, N. J.
New York, N. Y. · Philadelphia, Pa. · St. Louis, Mo.
Chicago, Ill. · Elkton, Va. · Los Angeles, Calif.
In Canada:
MERCK & CO. Limited Montreal · Toronto · Valleyfield

Merck Vitamin Products for Enrichment and Fortification

CROWN SPRA-TAINER



First ON THE MARKET First IN SALES

Spra-tainer was the first and original aerosol-type propulsion can and is still the leader. Due to Crown's Special Patented Method of Manufacturing, Spra-tainer has "NO-SIDE-SEAM, NO-TOP-SEAM." This insures more *strength*, greater *dependability*—hence utmost protection for Your Product. Added strength and dependability naturally mean Your Product reaches the Customer in best possible condition!

For complete details about the ideal advantages of packing in Lithographed Spra-tainers, have a friendly Crown Sales Representative call.

One of America's Largest Can Manufacturers

CROWN CAN

Plants at Philadelphia, Chicago, Orlando. Branch Offices: New York, Baltimore, Pittsburgh, St. Louis • Division of the Crown Cork & Seal Company

Food Industry News

Florida Citrus Canners Plan Battle Against Control by State Code

Florida citrus canners expect a difficult and prolonged court fight against the Florida Citrus Code. The "code" is a 79-page regulatory statute enacted by the Florida legislature at its 1949 session. Purpose of the law as stated in the opening sentence, is "to provide for the regulation and control of the citrus industry of the State of Florida." And that is exactly what it does.

Under the code there is a complete and detailed control of the raw material that may be utilized in processing. The processor is required to pay inspection fees and every pound of fruit must be inspected by state officials. Special sampling machinery must be used.

Would Control Mixing, Too

There is a comprehensive inspection and control of manufacturing. The processor pays taxes to support the inspection. The code provisions even control the mixing operations and the raw juice from which the canned product may be made. Florida canners found that these code provisions for processing are inconsistent with those controlling raw fruit. The result is that raw fruit acceptable under the code cannot be processed under the code provisions.

The code provides for comprehensive grading and grade labeling. It makes the voluntary USDA grades compulsory in the state. In addition, there is a complicated State export system that regulates and restricts outbound shipments in interstate commerce.

The law was passed in spite of the opposition of a vast majority of the canners in the State as well as a high percentage of the growers of citrus.

The Florida "code" had its beginning when federal subsidies to citrus growers were withdrawn at the end of World War II and prices dropped sharply. This came at a time when new groves, started during the prosperous war years, were beginning to bear fruit.

Faced with this overproduction, a large part of the growers and shippers tried to get federal marketing agreements for the citrus industry. Others in the industry opposed this, believing that industry could solve its own problems without federal intervention.

When a bill introduced in the U. S. Congress was defeated, the growers tackled the State Legislature. Here, with the support of a State political organization headed by the Governor, the bill got through.

Florida canners feel that the pattern of this legislation is a matter of concern not only to the citrus canners, but to the food industry as a whole. They see in the law a startling development for controlling industry. The law is a political as well as a legal document. Economics of the grower were behind its enactment. In addition, it includes an indirect method to require compulsory factory inspection, grading and grade labeling of food products.

Before the law became effective on Oct. 1, 1949, a large number of canners sought and obtained a restraining order in the federal court. But later, an injunction was denied because the canners could not show "irreparable damage."

Last January the National Canners Association concluded that the code constitutes such a great threat to the freedom of action of individuals in the canning industry that it authorized its lawyers to help the Florida canners fight the code through the U. S. Supreme Court if necessary.

Meanwhile other legal actions are continuing to clarify the meaning of the statute and to determine its precise impact upon operations, and movement of goods in interstate commerce.

Caution Poultry Industry On Antibiotic Use

Foreseeing the possible widespread use of antibiotics in the poultry industry, University of California and State Dept. of Agriculture scientists recently conferred on some of the implications of using antibiotics in feeds.

This group concluded that as yet there is insufficient information concerning the use of antibiotics to justify a general recommendation of their use as feedstuffs.

It was agreed that, if the antibiotics themselves produce the observed growth effect simply by reducing the numbers of competing micro-organisms in the intestinal tract, it is possible that resistant micro-organisms may in time develop and thus nullify the effect of the antibiotic. Whether such resistant microorganisms would be more or less harmful to the bird than are the microorganisms now common, is purely speculative.

Better Believe in Signs

Here is a portion of the specially designed greenhouse completed under the direction of the Atomic Energy Commission and the Department of Agriculture, at Plant Industry Station, Beltsville, Md. The new building will allow for additional research in plants and soils using radioactive isotopes.

Pop-Sorghum Has Something That Popcorn Hasn't

Pop-sorghum—a cross between Haiti's Petite mil and India's Shallu developed by plant breeders of the Texas Agricultural Experiment Station—is reported by Texas A. & M. College as possessing one big advantage over popcorn: The hull is thinner and more tender so there is less husk to lodge between the teeth.

Pop-sorghum is judged by samplers to be just as delicious and nutritious as popcorn. But its expansion is around 15 to 1—about the same as the popcorn varieties of 10 years ago, but not nearly as high as the 25–30 to 1 expansion of the large grained popcorns of today. This small size, however, makes pop-sorghum just right for packaged caramel and candied confections, says R. E. Karper, agronomist in charge of grain sorghum investigations, and the product has possibilities as a puffed breakfast cereal. Pop-sorghum stays crisp for a considerable time after being popped.

The Texas Station distributed a small amount of pop-sorghum seed to seedsmen for increase and distribution to the trade. No further seed is available for distribution in 1950.

Labor Board Approves Area Bargaining

Areawide bargaining in an industry will be protected by the National Labor Relations Board under the Taft-Hartley Labor Law. This is emphasized by recent decisions from the board and its general counsel, Robert N. Denham.

It seems to lessen the chances that the AFL Bakery & Confectionery Workers will be granted the right asked to bargain on a companywide basis with Continental Baking Co. The union's threat to strike Continental last April to force it into companywide, instead of area, bargaining was withdrawn with the understanding that the union would petition NLRB for certification on a companywide basis. This petition is pending.

NLRB has now indicated its support of area bargaining by denying two requests for elections among maintenance employees of General Baking Co. in Oklahoma City. One was an individual worker's petition to decertify the AFL Building Service Union as bargaining agent. The other petition, by the Teamsters Union, asked for bargaining rights over these same employees.

In denying both petitions, NLRB asserts that a bargaining unit of a single employer is inappropriate because, for several years, General Baking and three other bakeries in the area have bargained jointly on labor matters.

In a decision involving eight dairies in Cleveland, NLRB goes even further. Since the war, these dairies have bargained jointly with the International Association of Machinists, and have signed identical but separate contracts covering maintenance personnel. Now the Teamsters have been granted an election by NLRB in a single unit covering all these employees. The dairies agreed that a single, multi-employer unit is appropriate. But the Machinists Union insisted that elections should be company by company.

In overruling the Machinist Union view, NLRB said it has established the principle that participation in joint bargaining negotiations and adoption of a uniform agreement indicate a desire for joint, rather than individual, action, and warrant establishment of a multi-employer unit.

Denham has backed the board up. When the Teamsters struck only three of nine dairies in Washington in June, the others shut down, having been part of the same negotiations that led to the strike. The union cried illegal lockout, filed unfair practice charges with Denham's office. Denham tossed them out. The dairies have bargained with the union in an area association, Denham said, and a strike against one is a strike against all of them.

Alaskan Canners Delayed By Union Disputes

Seventy Alaska salmon canneries had to hustle to get their supplies north this season, after being delayed 25 days until June 5 by the picketing of ships scheduled to carry cannery cargo.

The picketing was due to a jurisdictional dispute between Local 7-C, International Longshoremen & Warehousemen's Union, and Local 46, International Fishermen & Allied Workers of America, both CIO, on one hand, and Local 77, United Packinghouse Workers, CIO, and the Alaska Fish Cannery Workers, AFL, on the other.

The Alaska Salmon Industry, Inc., had previously recognized Local 77 and the Alaska Fish Cannery Workers, but the other two unions insisted they were the proper bargaining agencies. On May 10, Local 7-C threw a picket line around ships loading cannery supplies and the longshoremen accordingly stopped work.

Under an agreement reached June 4, hiring is placed on a seniority basis, without regard to union affiliation, leaving the designation of bargaining agencies for next season to the NLRB.

Members of Local 46, representing 1,400 native cannery workers in Bristol Bay, received wage increases amounting to $20 a man for the season, giving them equality in wages and working conditions with non-resident workers. Local 7-C, representing non-resident workers, won a provision for a hiring hall operated by the Washington State Employment Office and equal division of jobs between resident and nonresident workers. Local 77 and the Alaska Fish Cannery Workers were given the same terms.

Pay scales for the 45-day season range from $445 to $560. The industry employs about 20,000 men.

Liquid Turbidity Tested By Measuring Device

Turbidity or cloudiness of liquids can be measured by a device developed by Dr. Z. I. Kertesz, food chemist at the New York Experiment Station, Geneva.

The turbidity tester is a boxlike container made of transparent plastic, approximately 3x5x1 in. It is open at the top and bottom, but is divided into two compartments by a diagonal plate upon which is engraved a scale of units for measuring the "turbidity number" of the liquid under test.

In operation the top section of the tester is filled with the test liquid and the observor's vision is then directed horizontally from the direction of the narrow side of the instrument through the liquid and toward the dividing plate and the scale. The last line on the scale visible through the liquid column marks the thickness of the liquid in centimeters and is the "turbidity number." In experimental work, readings may be made as close as 0.25 unit, but for practical commercial purposes the nearest 0.50 unit will suffice.

Within reasonable limits the intensity of the light and the coloring of the test liquid do not affect the turbidity values obtained, but good light makes the reading easier. While the instrument has definite limitations, it is expected to prove of value where a large number of determinations are required in a limited time.

Make Low-Cost Dessert From Frozen Puree

A frozen fruit puree dessert that retains the natural flavor of the fresh fruit, and which shows promise for commercial production because of ease and economy of manufacture, has been developed in the food technology department of the Oregon State College experiment station.

The dessert was developed in studies

made by Glen Lundeen, research fellow in food technology, according to E. H. Wiegand department head. It is a boysenberry puree blended with apple or peach puree and was found to make a highly acceptable frozen dessert in packing and taste-test trials. Peaches, cantaloupes and strawberries also were used with good results.

Lundeen found that pureed fruit yields an excellent product that is rich in natural fruit flavor and sweetness. Used in a frozen dessert, the product combines excellent flavor with an appealing appearance, good consistency, texture and melt-down characteristics similar to ice cream. Fruit content of the frozen dessert is 60 percent or more, as compared with 20 percent by weight of fruit juice found in ice cream, fruit ices and sherbets.

Simplicity and low cost of manufacture are two factors which enhance the commercial possibilities of this dessert. In preliminary studies, the cost of the ingredients—fruit puree, sugar and stabilizer—amounted to 8c. a pint.

The dessert can be mixed in an ice cream freezer and served directly from it, or may be packaged in pint cartons for storage. Experimental packs were stored for four months at 0 deg F. with little deterioration of color or flavor.

Egypt Imports Meat

The Egyptian Minister of Commerce and Industry has signed contracts for the import of large quantities of frozen meat of the best quality from Argentina and Uruguay. Although livestock have been imported in the past from Lybia, Ethiopa, and the Sudan, this is the first time for frozen meats.

The contracts were signed only after the South American exporters agreed that the supply of frozen meat will be from livestock to be slaughtered according to Egypt's Moslem traditions. Slaughtering will be done under the supervision of Egypt's diplomatic corps in Argentina and Uruguay.

"THERE! NOW WILL YOU STOP WORRYING ABOUT WHETHER YOU LEFT THE PRESSURE COOKER ON OR NOT?"

STEEL

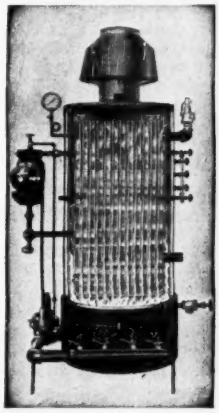
Every Kind
Quick Delivery

Plates, Structurals, Bars, Sheets, Tubes, etc. . . . Carbon, Alloy and Stainless Steels . . . .

RYERSON

Joseph T. Ryerson & Son, Inc. Plants: New York, Boston, Philadelphia, Detroit, Cincinnati, Cleveland, Pittsburgh, Buffalo, Chicago, Milwaukee, St. Louis, Los Angeles, San Francisco

MAXIMUM AUTOMATIC STEAM IN *MINIMUM* FLOOR SPACE . . .



The Kane Boiler is built to A.S.M.E. specifications, in sizes to 30 H.P.

the Kane Boiler Package

Each KANE BOILER PACKAGE is carefully considered by us as an "individual" job,—from the customer's requirements to the finished unit. And each BOILER PACKAGE is a compact, self-contained steam source that includes: The correctly sized KANE Automatic Gas-Fired Boiler complete with gas burner and controls to maintain required steam pressure; and an M-K-O Automatic Boiler Feed system designed to return condensate and supply make-up water as required for highest operating efficiency.

Engineered Steam at its best with four decades of experience at your disposal—so, send your steam problem to us for study and recommendation.

ENGINEERED STEAM AT ITS BEST

MEARS·KANE·OFELDT INC.

1903-1915 EAST HAGERT STREET, PHILADELPHIA 25, PA.

FOUR DECADES OF AUTOMATIC GAS-FIRED BOILER MANUFACTURING EXPERIENCE

Agree to Grade Changes For Frozen Citrus

Changes in three proposed grades for frozen citrus concentrates have been agreed upon by USDA after receiving recommendations of an industry group, which met in Washington June 12, under the auspices of the National Association of Frozen Food Packers. Because of objections to the grades originally proposed, the NAFFP called a meeting to obtain national industry recommendations on revisions, and practically every major packer of frozen citrus concentrates had a representative present to participate in developing recommended grades. Companies represented were: American Fruit Growers, BirdsEye-Snider Co., Damerel-Allison Co., Minute Maid Corporation, Pasco Packing Co., Real Gold Citrus Products, Snow Crop Marketers, and Tree Sweet Products Co.

During the course of the meeting, industry representatives discussed in detail most features of the proposed grades for frozen concentrated orange juice, frozen concentrated grapefruit juice, and frozen concentrated blended grapefruit and orange juice. A number of changes in the proposed grades were believed necessary to insure their workability for packers in all producing areas. USDA representatives present gave sympathetic attention to these recommendations and assured the industry group that the necessary changes would be written into the grades.

AIB Begins New Studies On Bread Staling

New studies on the causes and prevention of staling in bakery products are being undertaken by the American Institute of Baking as part of the Dept. of Agriculture's research program. Objective is the determination of the effect of starch, gluten, water solubles and other wheat flour fractions on the development of staleness. Work lies primarily in the field of chemistry, and it is hoped that the actual cause of staling can be determined. When the cause has been established, staling can be defined in scientific terms. At the present time staling must be defined in terms of consumer reaction and is measured subjectively or by arbitrary methods which may or may not correlate with the changes in bread known as staling.

The new work, carried out under supplement II to a research contract financed through provisions of the Research and Marketing Act of 1946, will be administered by the Northern Regional Research Laboratory, Peoria, Ill., in cooperation with the Production and Marketing Administration of the Dept. of Agriculture. Laboratory work will be carried out in AIB's new Chicago headquarters by personnel who have conducted the previous investigations. The new contract also retains services of the Baking Industry Research Advisory Council, which includes most of the top scientists in the industry.

Bag Packed Cranberries Ready to Take Over

USDA says that cranberry packers may as well give up the old wooden box and pack their product in cellophane bags. The difference in cost is small and customers prefer the individual size bag. USDA reports that about 75 percent of the 1949-50 crop was sold in the pre-packaged form.

Farm Credit Administration specialists say that representative packers find it costs very little more to package cranberries in consumer-sized cellophane bags than in the quarter-barrel wooden boxes. Actually, the savings from eliminating the box nearly offset the new prepackaging costs, FCA says.

One-pound packages are either bought ready-made and filled at the plant, or are both made and filled at the plant by a special machine that turns out a pillow-shaped bag. Ready-made bags have generally been more satisfactory for small volume operations, FCA reports, by avoiding heavy investment in machinery. FCA concludes that in spite of the problems raised by change-over to individual bags, it would be a wise idea to switch.

T-H Bakery Exemption Repeated by NLRB

The National Labor Relations Board has reiterated its view that bakeries are essentially local operations and that it would not effectuate the policies of the Taft-Hartley labor law to assert jurisdiction over them.

In the most recent case, the Board dismissed charges of the AFL Bakery & Confectionery Workers Union that Hart's Bakery, Inc., located at Sikeston, Mo., interfered with efforts of the union to organize the bakery's employees. The decision in the Sta-Kleen Bakery case was cited as a precedent for finding bakeries to be local operations.

In making an exception to this rule, the volume of business done by the bakery is only one of the factors to be considered, the Board ruled, referring to an earlier decision involving Lewis Brothers Bakeries, Inc. The Hart's Bakery dispute was rejected by the Board even though the bakery in 1948 bought $100,000 worth of materials, 90 percent of it from outside Missouri. In the same year it sold $313,000 worth of bakery products, but only three percent of it was shipped outside the state.

Board Member Paul L. Styles dissented, contending that the Board should consider the merits of the case because of the company's "substantial" interstate operations. He is a former AFL union leader from Alabama.

Dairies Up Wage Scales And Ask Price Rise

Milk prices may rise a half cent a quart in Washington, D. C., after the average 5½-day week, with no pay loss, goes into effect for both driver-salesmen and inside dairy employees. Prices dropped one cent last April, to 20½ cents for Grade A or plain homogenized milk. Request for the increase has been made by some of the dairies.

The AFL Teamsters Union won shorter work weeks in Washington and Pittsburgh following one and three-week strikes, respectively, in June. In Washington, all employees will alternate 48 and 40-hour weeks, for an average of 44 hours. The union refused the offer of the dairies for a 40-hour week if they could operate six instead of seven days.

In Pittsburgh, the inside dairy employees will work 44 hours at 48 hours' pay. Hours of driver-salesmen will not be reduced, but their daily guarantee will be $12.50 instead of $10.

Prevailing practice for milk deliveries is still the wartime inspired every-other-day delivery, with seven-day operations. It was in effect in 274 major cities last spring. Next most popular is six-day operations, with deliveries three times a week to each customer. The prewar six and seven-day deliveries continue in small towns only.

Honey Refining Method Developed by USDA

Methods of refining dark or strong-flavored honey so it can be used as sweetening have been developed by USDA scientists at the Eastern Regional Research Laboratory, Philadelphia.

Laboratory researchers treated these strong-flavored honeys with bentonite, a type of clay. A milder honey is the result. They also have devised a charcoal process to make a completely deflavored honey sirup. The processes remove nothing from the honey but the strong flavor and color.

50 gal. drum, hinge-type cover and dolly

IT'S NEW

IT'S ALUMINUM ALLOY

IT'S PERFECT FOR... all food plants where sanitation, lightness, mobility and economy of the food handling equipment are important.

Here's the easy, sanitary way to handle foods! The aluminum drum is seamless, has open bead; and wearing ring on the bottom is attached with a continuous weld. Easy to move around because aluminum is light. Dent-resistant and long-wearing because drum and cover are made of Wear-Ever's famous, extra hard alloy. And remember, aluminum is friendly to foods.

For additional information, mail the coupon to: The Aluminum Cooking Utensil Co., 308 Wear-Ever Bldg., New Kensington, Pa.

USE THE 3 UNITS INTERCHANGEABLY FOR A VARIETY OF PURPOSES

DRUM

Choice of

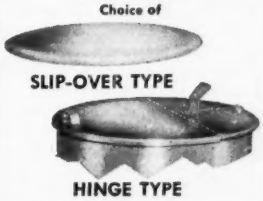
30 gal., 18" dia. x 27½" deep

50 gal., 22¾" dia. x 28½" deep

Both sizes have open beads; are available with or without handles.

COVER

Choice of



SLIP-OVER TYPE

HINGE TYPE

with lock-on bolt and cover rest

Also quick-lock type available

DOLLY

Use drum with dolly as a "removable" bin for easy inter-plant transportation

WEAR-EVER Aluminum

50TH ANNIVERSARY

1900 1950

WEAR-EVER ALUMINUM TRADE MARK REG. U.S. PAT. OFF.

The Aluminum Cooking Utensil Co.,
308 Wear-Ever Bldg., New Kensington, Pa.

Please send us complete information about your new aluminum drum, cover and dolly.

MAIL TODAY

NAME.....

FIRM.....

ADDRESS.....

CITY.....STATE.....

Solid Grain Bin

As usual these prairie skyscrapers are all too few during the wheat harvesting season throughout the wheat belt. This one belonging to a Stafford, Kans., supply company was filled early in anticipation of the annual box car shortage. (Wide World)

About 10,000,000 lb. of the annual production of 200,000,000 lb. of honey is difficult to market because of its dark color or strong flavor—it is rated "low-grade."

USDA thinks that the two processes should prove useful in marketing low-grade honey. Deflavored honey sirup, should be of use to manufacturers of confectionery, bakery products, beverages, and other foods. Although the refined (bentonite-treated) honey could find a market, the deflavored honey is not intended for direct consumer use.

Indian Tariff Protested By Pepper Exporters

Protests have been voiced by Indian pepper trade interests against an Indian government proposal to increase the tariff value of pepper from 200 rupees per cwt to 400 rupees per cwt. (The actual price on the market is more than 600 rupees per cwt). It is stated that the proposed increase would probably make the duty the highest for any commodity exported from India.

Meanwhile, Bombay pepper exports have been on a much larger scale than last year; in the first quarter of this year, almost 31,000 cwts were shipped, compared with 13,000 cwts in the corresponding period of 1949. In addition, the average price of pepper is about 3.5 times as high as it was a year ago.

Heavy Pickle Consumption Creates Short Supply

An increase of 8 percent in consumption of pickles during the first five months of 1950 over that for the same period in 1949 was reported to the mid-year meeting of the National Pickle Packers Association in Chicago.

James M. Irwin, H. W. Madison Co., Cleveland, commented that this 1950 increase in consumption, coupled with an indicated reduction in 1950 planted acreage, changes what appeared to be a substantial and adequate supply. He said inventories in grocery stores and warehouses are in short supply and that wholesalers and retailers alike are losing business because they are operating on too low an inventory.

F. Olney Brown, Squire Dingee Co., Chicago, reported that contracted 1950 acreage on June 1 indicates a total of 122,237, as compared with 144,670 acres in 1949.

President Leon S. Glaser, Glaser Crandell Co., Chicago, recommended to the more than 100 pickle packers present that they continue to improve the quality of their products, effectiveness of their packages, and the dollar value to consumer. He stressed the necessity of packers combating the pressure of pickle buyers for lower prices and of the fresh cucumber growers for higher prices with a program for prices that give a living profit and permit maintenance of high quality.

A. L. Demain, Research Fellow, Michigan State College, gave a progress report on a pickle quality study based on 400 jars of pickles sent in from the 1947-48 pack. The contents of these jars were representative of the industry geographically, in size, and diversity of products and were analyzed for acid, sugar and salt content, appearance, texture, and drained weight. The results showed packs of good to high quality. Over 50 percent classified as U. S. Grade A, 19 percent Grade C and 31 percent Grade D.

Can Companies Restricted By Anti-Trust Decrees

The ubiquitous tin can is one of the symbols of modern American manufacturing, packaging, and merchandising. The food industry alone packs in cans products worth about $3,000,000,000 per year and processed by plants in 46 of the 48 states.

Biggest factor in this big can-making industry for many years has been American Can Co., next in size is Continental Can Co. Between them they produce 80 percent of the cans sold in the U. S. They also produce and lease most of the high-speed, automatic can-closing machines—without which the tin can itself is almost useless.

But it now appears that the biggest factor in the can industry for the next few years is to be Judge George Harris of the Federal District Court, San Francisco.

In antitrust decrees handed down in June against American Can Co., and Continental Can Co. Judge Harris spelled out in vast detail exactly how the two companies must now conduct their business.

The decrees are the follow-up of the Judge's opinion handed down last fall that American Can had violated the Sherman and Clayton acts through a whole string of practices found to be monopolistic and in restraint of trade, as charged by government lawyers.

The government then asked—consistent with its current antitrust policy—for a splitup in order to put an end to these illegal practices. In this case, the government wanted American Can to sell off its can-closure machinery business, thus ending any tie-in of can-closing machines and sales of cans.

Judge Harris refused to order this divestiture, but he devoted most of his lengthy judgment to a point-by-point blueprint of exactly how American (and also Continental) must hereafter sell cans and can-losing machinery. Most of the provisions run for five years from Jan. 1, 1950; some run for 10 years.

Here are some of the high spots:

■ Tie-in contracts requiring can customers to use only American Can closure machines are out. So are contracts binding users of closure machinery to buy cans from American Can.

■ The "lease only" policy for can-closing machines is ended. The company must offer to sell and actually sell machines to applicants under precise methods and priorities specified by the court.

■ The purpose: "To assure those interested in owning machines the opportunity to purchase such machines and equipment owned or controlled by the defendant. . . ." Just to make this stick, the court is to appoint a master to report by January, 1952, on actual sales made. Then the judge will hold hearings to determine just what percentage of all can-closing machines owned and leased by the company should be sold by 1956.

■ Closing machine rentals in the future must be on an economic basis and must return a reasonable profit to the company. The machines may not be installed in a can customer's plant at uneconomically low rentals on condition that the customer buy his cans from American Can.

■ Requirements contracts — which bind a can buyer to buy only from American Can for a specified period

of years—may run no longer than 12 months. Heretofore, American Can sold more than 90 percent of its cans through such requirements contracts, most of which ran five years, some anywhere from 3 to 20 years. Anti-trusters asked a complete ban on all requirements contracts, regardless of the length of time covered—and they count the ruling a major defeat.

■ Single-plant sales arrangements are to be required. The decree bans any can sales contract or arrangement that wraps a multiplant customer for all his business. Sales must be made—and prices fixed—on the basis of sales to individual plants.

■ Discrimination in price is banned through a whole string of injunctions against such practices as rebates, transportation allowances, high prices paid for used machinery, phony rentals of customers' warehouses. Perhaps most important, American Can may not fix a price differential that favors the requirements contract customer to the disadvantage of the spot customer who has no contract.

■ Delivered pricing and freight absorption are permitted—but American Can must also sell f.o.b., and the delivered price can't be any higher than the f.o.b. price plus actual freight charges.

There are scores of other directives to the company in the court order. Government lawyers say this is the first time they have ever had such a big bundle ordered by a court at the end of a trial. Ordinarily, most of these

Miss (Official) Cheesecake

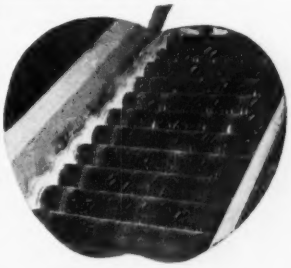
The Associated Retail Bakers of America picked this young lady to reign over their 32nd annual convention at Long Beach, Calif. Throwing subterfuge to the winds her title was Miss Cheesecake. (Wide World)

WHERE POLISHING THE APPLE PAYS OFF

FULLERGRIPT BRUSHES HELP GROWERS GET TOP MARKET PRICES

At Upland Farm, Inc., Peterborough, New Hampshire, they use a Trescott Apple Grader containing a brusher for polishing apples. This grower appreciates the extra sales-appeal and market value added to his product by its improved appearance.

Built into the patented Trescott apple brusher are long-lasting Fullergript spiral, rotary brushes. The brush material is loop-anchored inside a rigid, rust-resistant metal channel. Countless sensitive bristle tips thoroughly clean away any spray residue and beautifully polish the skins of the apples. Another prominent grower estimates that polishing apples by machine replaces 60% of the hand labor formerly involved.



Fullergript brushes are producing economies in many branches of the food industry. If your business is not yet enjoying the savings made possible by Fullergript, you may secure information simply by writing to . . . . .

FULLERGRIPT The FULLER BRUSH CO.

INDUSTRIAL DIVISION
3640 MAIN STREET
HARTFORD 2, CONN.

MAXIMUM

Freezing Capacity

MINIMUM

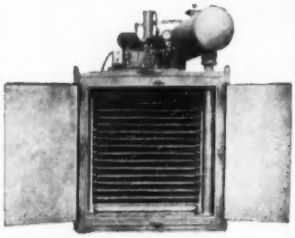
Floor Space

with

Amerio Freezers

(Patent Applied For)

PERFECTED POSITIVE PLATE PRINCIPLE



Model B 15 Stations

38½ sq. ft. floor space
506¼ sq. ft. Freezing Surface

FREEZING OUTPUT

Up to 13,000 lbs. of fruits or vegetables; 16 hour day.

Up to 20,000 lbs. of fish in 16 hour day. Similar efficiency in meats, poultry and juices.

You can freeze several sizes of packages in the one load.

Name your product: we'll give you freezing time and output.

Amerio Freezers lead in Quality, Speed, Flexibility, Simplicity and Economy. Let us prove it.

For Detailed Data
Send for Illustrated Brochure

Amerio
Contact Plate Freezers Inc.
Union City, N.J.
"It's the Contacts that Count"

"It's the Contacts that Count"

Spreads Dandy

With margarine taking a new lease on life, Lever Bros. lost no time getting in a bit of publicity for Good Luck. This one is designed to painlessly demonstrate the spreadability of the stuff in making sandwiches for outings.

injunctions have been won only when the company negotiates a settlement with the antitrust lawyers out of the court—the so-called "consent decree."

Also, the government claims the decree is more "self-enforcing" than any they can recall. Besides the appointment of a master to follow-through on the can closing machinery sales, the court also ordered the company:

1 To send a notice to each machinery lessee of his right to buy the machine or machines and the sales price as computed according to specifications spelled out in the decree;

2 To report semi-annually for five years on the number of machines sold and the prices; the number of machines leased to non-can-customers; changes in rental charges;

3 To inform all salesmen, servicemen, engineers, and others of the terms of the court decree;

4 To keep for 10 years complete records, available on notice, on container and closing machines business, including correspondence with customers, sales prices, etc.

5 To cooperate with antitrust officials who may visit the company offices to see records, interview officials.

As one government lawyer put it, "the company has to conduct itself sort of like a public utility."

It was not known immediately whether the decision would be appealed to the Supreme Court directly from the district court, as is permitted in civil antitrust suits. One guess had it that neither side would appeal—the company, because of the threat of divestiture, which the government would surely ask for again, and which the Supreme Court might possibly order; the government, for fear of upsetting a judgment that, in many respects, is a model they'd like the courts to follow.

There was another angle, too, for American Can to consider. Recently two of its customers have won sizeable triple-damage suits on the basis of price discriminations granted to competing canners. There's an incentive to end any policy or practice that might support the claims of other can buyers who figure they'd like some of that easy triple-damage money.

Chemicals in Foods

Slight progress has been made on the investigations of chemicals in foods since this subject was reviewed four months ago (see FOOD INDUSTRIES, April, p. 130). Food and Drug Administration is continuing with its hearing on residue tolerances for insecticides and other chemicals used in farm production of fresh fruits and vegetables. The House of Representatives is just beginning its investigation authorized by House Resolution 323, introduced by Representative Sabath (D., Ill.). And the National Research Council conference on food protection was naming its committee in July.

The F&DA hearing will probably last until fall. Quantitative tolerances

for specific chemicals are currently being discussed at the hearing in Washington.

The House investigation has three phases: Use of chemicals in foods, use of pesticides in relation to foods, and use of chemicals in fertilizer. Membership of the committee was not known when this issue went to press, although it was expected that Mr. Delaney (D., N. Y.) would be chairman. Three additional Democratic members and three Republican members were expected to be named by the Speaker of the House. Potentially this subject could develop into extensive hearings.

Nominees for the National Research Council committee to investigate "diverse problems relating to the production of food supply" were being invited in mid-July to participate in the study. Personnel of this committee will probably be announced before Labor Day.

Clarification of Pricing Blasted by Truman

After two years of exasperating toil and trouble, Congress passed a law to clarify the legality of three simple business practices: Delivered pricing, freight absorption, and meeting a competitor's price without getting into antitrust trouble. After 10 days of consideration, Truman knocked the whole effort to the ground with a veto of the bill.

As a result, many a front office in industry echoed with the frustrating question: "Well, where do we stand now?"

The simple, but not very helpful answer, of course, is "legally, you are in about the same spot you were in two years ago when the Supreme Court banned basing points in the cement industry."

Which is no answer to the businessman who has been waiting for a new law to give him answers in unmistakeably clear non-legal English.

But, with hope for clarifying legislation ended, here's what businessmen will have to fall back on:

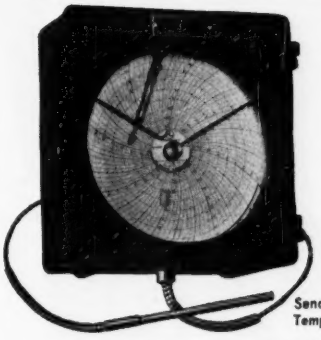
1. Freight absorption and delivered pricing used by an individual company in the absence of any collusion, conspiracy, or "planned common course of action" is legal.

Federal Trade Commission, Department of Justice, Congressmen on both sides of the basing point fight, and President Truman all agree on this.

2. Basing point pricing is still just as illegal as it was. FTC will continue to cite industries in which all producers of a standardized product use the same basing points or other freight equalization plans that produce an identical delivered price for all users.

AUTO-LITE

TEMPERATURE RECORDERS



Model "500" Temperature Recorder. Priced from $37.50.

For your specific needs!

★ Precision-built recorders provide money-saving proof of temperature behavior.

★ Low-cost protection . . . due to large scale, specialized production.

★ Wide selection of chart ranges.

★ 4 standard types; choice of 24 hour or 7-day movement.

Send for catalog showing Auto-Lite Temperature Recorders and Indicators.

THE ELECTRIC AUTO-LITE COMPANY
INSTRUMENT AND GAUGE DIVISION
TOLEDO 1, OHIO
NEW YORK • CHICAGO • SARNIA, ONTARIO

INDICATING & RECORDING THERMOMETERS

DETECTO SCALES

There's a precision-accurate Detecto Scale for your specific weighing and counting need. The Detecto helps increase production, yet assures you maximum accuracy by making slightest weight discrepancies immediately visible.

No. 1800 DETECTO-GRAM INDICATOR HEAD

One more Detecto weighing instrument to speed production. This attachment converts your present beam scales to accurate weighing equipment. Indicator stops instantly at correct weight.

Write for Literature

DETECTO • SCALES • INC.
MAKERS OF FINE SCALES SINCE 1900
548F PARK AVE. • BROOKLYN, 5, N. Y.
SCALE ENGINEERS IN ALL PRINCIPAL CITIES

POWERS

DIAL THERMOMETERS

VARIETY OF RANGES

Help Cut Costs—

For more accurate temperature readings and improved efficiency use POWERS Dial Thermometers. They're vapor pressure actuated. Have 4″ dials with either rigid stem for use in pipe lines and tanks or flexible tubing type for conveniently showing the temperature at a remote point. For further information and prices phone or write our nearest office. Offices in 50 cities. Over 55 years of automatic temperature control.

(DT2)

WRITE FOR BULLETIN 355

THE POWERS REGULATOR CO.
2700 Greenview Ave., Chicago 14, Ill.
Gentlemen: Please send me Bulletin 355.

Name_____ Title _____
Firm Name _____
Address _____

3. "Meeting a competitor's lower price in good faith" may or may not be a complete defense against a charge of price discrimination. This is the issue in the now-famous Standard Oil of Indiana case, which the Supreme Court will decide this fall—and the issue that brought on the Truman veto.

One provision of S.1008 would have made "meeting a competitor's price in good faith" a complete defense against a charge of price discrimination. A dozen or more small business organizations, backed by Congressman Wright Patman and Senators Long, Douglas and Kefauver, claimed that this spelled the end of the price protection the small business man gets from the Robinson-Patman Act.

Their theory: it's easy for the big seller to show that he's only "meeting a competitor's lower price" when he gives some of his customers a better price than he gives other customers.

Standard Oil Case

Right now, sellers know they can be hauled into court for meeting a competitor's price as Standard Oil did. The company sold at a jobber's price in Detroit to a retail chain, and to wholesalers who also retailed gasoline. Other gasoline retailers complained to FTC that the 2 cents a gallon difference enabled these competitors to undercut them on retail prices—and this was driving them out of business. It all was illegal, they claimed, under the Robinson-Patman Act.

FTC agreed. And it agreed with Standard Oil, too, when the company said it was "meeting a competitor's price in good faith." But, said Federal Trade, "this only stops us from automatically deciding against you just for charging different prices to gasoline retailers who compete with one another."

FTC then said, "we have to go behind all this now, and see whether there has been any injury to competition. If there is none, you're in the clear." But FTC found there was a lessening of competition among the gasoline retailers; so, despite Standard Oil's "meeting a competitor's lower price," it should cease and desist.

The Seventh Circuit Court of Appeals agreed with Federal Trade. The Court held that the company could (1) stop selling to wholesalers at prices different than it charges retailers or (2) refuse to sell wholesalers who sell to retailers at prices below what Standard Oil charges to retailers it sells direct.

Standard Oil appealed, and now it's up to the Supreme Court. The Court, rather than Congress, now has the chance to say whether or not FTC is right.

On the basing point-delivered pric-

ing issue, Federal Trade has taken steps recently to make it clear that, so far, it takes action only when there is conspiracy or "implied conspiracy" involved. Just before the Truman veto was announced, FTC issued a formal release chiding newswriters for "failing to make clear" that a proposed order against 16 corn products concerns would prohibit the use of basing point and zone pricing systems of pricing "only when such systems involve concerted action, conspiracy, or unlawful agreements . . . " The part in quotes was underscored.

Becomes Green Giant

Recognizing the growing value of its brand name, the Minnesota Valley Canning Co. recently changed its corporate name to The Green Giant Co. In addition to more closely identifying the company with its products, President E. B. Cosgrove pointed to the fact that the old name no longer represented the company's operations. Packers of quality peas and vacuum packed corn, the company now has 25 plants in seven states and two in Canada. It was founded at LeSueur, Minn., in 1903.

USDA Grade Standards

Recent actions by Production and Marketing Administration of the Department of Agriculture on U. S. Grade Standards and related activities include the following:

Lobster for Freezing

Australian processors are building up exports of frozen lobster tails, encouraging more and more fishermen to give up net fishing for lobster catching during the six months open season. About 75 percent of the catch is now being exported, most of it to the U. S. (Eastern)

Standard SPIRAL CHUTES
...MOVE MERCHANDISE FROM UPPER TO LOWER FLOORS — FAST — AT LOW COST

Scientifically designed, properly pitched Standard Spiral Chutes are effective time, work and money savers. Engineered in a wide range of types and sizes. Cost nothing to operate. Get complete information — send for Bulletin No. FI-80

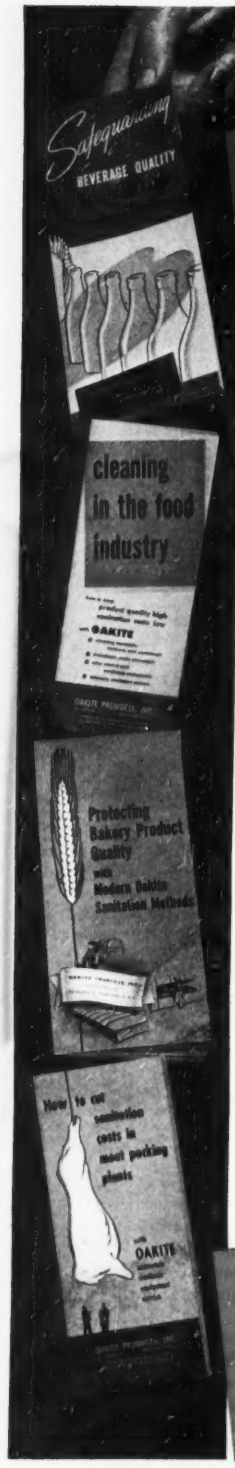
STANDARD CONVEYOR COMPANY
General Offices —
North St. Paul, Minn.
Sales and Service in Principal Cities

Standard GRAVITY & POWER CONVEYORS

SARCO No. 9

Gets more heat out of the steam and more production out of steam equipment. The inexpensive, highly efficient trap that gives quick starts because it's wide open when cold. Capacities recently doubled. Can't freeze. No seat changes required when pressure changes. Catalog No. 250.

282
SARCO SAVES STEAM
SARCO COMPANY, INC.
Represented in Principal Cities
Empire State Building, New York 1, N. Y.
SARCO CANADA, LTD., TORONTO 5, ONTARIO
IMPROVES PRODUCT QUALITY AND OUTPUT


Safeguarding
BEVERAGE QUALITY
cleaning in the food industry
— OAKITE
Protecting Bakery Product Quality with Modern Oakite Sanitation Methods
How to cut sanitation costs in meat packing plants
with OAKITE

4 fact-filled guides to low-cost, plant-wide sanitation— FREE

Now—whether you process meat, food, soft drinks, or baked goods—you can get practical answers to your cleaning problems in these Oakite guides to sanitation. Packed with photographs, diagrams, step-by-step details, they tell

Bottlers how to get film-free bottle washing, trouble-free machine operation. Sanitary conveyor chain lubrication. Faster, more thorough bacteria and mold control. Quick removal of scale from water-circulating equipment.

Food Processors how to steam-clean packaging machines, trimming tables, tubs, vats, tanks, conveyors, elevators. Remove grease, stains, tarnish from metal equipment. Chemically sterilize. Remove rust and scale from heat-exchangers.

Bakers how to clean bread pans, cake and pie tins without spangling or discoloration. Clean aluminum angel food pans without damage. Steam-clean bread and cake racks in half the time. Control mold growth. Remove rust, scale, slime, algae from humidifying equipment.

Meat Packers how to clean beef kill floors, wooden curing vats, beef chilling vats, cooking kettles. Clean smoke house walls and ducts in half the time, without scraping. Scald hogs without damage to hides, without fouling tanks. Remove scale from water circulating units. Batch-clean 500 trolleys in 1 hour.

FREE booklets tell *all* about floor cleaning, deodorizing, paint stripping, fleet maintenance—other Oakite short-cuts to low-cost, plant-wide sanitation. Write Oakite Products, Inc., 14C Thames St., New York 6, N.Y.

SPECIALIZED INDUSTRIAL CLEANING
OAKITE
MATERIALS • METHODS • SERVICE

Frozen brussels sprouts, revised, proposed, p. 3839, June 17 *Federal Register,* written comments received until July 17.

Dressed poultry and dressed domestic rabbits, form of application and contract for inspection service, new, p. 3981, June 21 *Federal Register,* effective July 22.

Canned pineapple, second revision, p. 4099, June 27 *Federal Register,* effective June 27.

Frozen concentrated orange juice, revised, proposed, p. 4198, June 30 *Federal Register,* written comments received until July 30.

Frozen concentrated blended grapefruit juice and orange juice, new, proposed, p. 4195, June 30 *Federal Register,* written comments received until June 1, 1951.

Frozen concentrated grapefruit juice, new, proposed, p. 4228, July 1 *Federal Register,* written comments received until June 1, 1951.

Blueberries for processing, new p. 4258, July 6 *Federal Register,* effective Aug. 5.

Frozen corn-on-the-cob, new, p. 4258, July 6 *Federal Register,* effective Aug. 5.

Canned grapefruit and orange for salad, new p. 4260, *July* 6 *Federal Register,* effective Aug. 5.

Frozen okra, new, p. 4309, July 7 *Federal Register,* effective Aug. 6.

Canned blueberries, revised, proposed, p. 4312, July 7 *Federal Register,* written comments received until Aug. 6.

Frozen blueberries, revised, proposed, p. 4314, July 7 *Federal Register,* written comments received until Aug. 6.

Frozen broccoli, revised, p. 4211, July 1 *Federal Register,* effective July 31.

Brussels sprouts, new, proposed, p. 3587, June 8 *Federal Register,* written comments received until July 8.

Fresh kale, new, proposed, p. 3686, June 13 *Federal Register,* written comments received until July 13.

Green corn, revised, p. 4242, July 4 *Federal Register,* effective August 3.

F&DA Food Standards

Status of food standards actions by Food and Drug Administration at the beginning of July is reviewed below.

Residue tolerances. Resumed on July 10 to discuss toxicity of specific chemicals, as outlined in June 27 letter of presiding officer, B. D. Levinson. Probable duration of Part D of hearing three months.

Frozen fruits. Long awaited; hearing adjourned in July 1948, briefs filed Oct. 1948.

Bread. Not expected soon; hearing

adjourned in September 1949, briefs filed Feb. 1950. (Tentative order will *not* be withheld by Food and Drug until completion of House hearing on chemicals used in foods, as rumored elsewhere; order will be issued by F&DA as soon as possible).

Canned mushrooms. Amended; expected soon; hearing adjourned in June, briefs due to be filed by July 20.

Cheeses. Long awaited; tentative order published in Apr. 1949.

Salad dressings. Long awaited; tentative order published in Nov. 1949.

Canned corn. Expected soon; no basic exceptions to tentative order received in June.

Coal-tar color, FD&C Violet No. 1. New; published on p. 3517, June 7 *Federal Register,* effective Sept. 5.

Preserves. Amendment, requested by industry, announcement expected soon.

Ice cream. New, resumption of prewar hearing, may follow residue tolerances hearing in late fall or winter.

Schedule of Events

August

7- 9—International Apple Assn., 56th annual convention; Statler Hotel, Washington, D. C.

7-19—First International Trade Fair, Coliseum, International Amp-theater, and Navy Pier, Chicago.

14-25—University of Colorado, short course in statistical quality control, College of Engineering, Boulder, Colo.

28-30—American Soybean Assn., 30th annual convention, Illinois State Armory, Springfield, Ill.

September

5- 9—American Chemical Society, Chicago Section, 6th national chemical exposition, Coliseum, Chicago.

10-13—National Frozen Food Locker Association and Frozen Food Locker Institute, joint convention, Palmer House, Chicago.

17-19—Southern Bakers Assn., exposition and production conference, Municipal Auditorium, Atlanta, Ga.

23-26—Packaging Machinery Manufacturers Institute, 18th annual meeting; The Homestead, Hot Springs, Va.

29-Oct. 3—American Meat Institute, 45th annual meeting, Palmer House, Chicago.

October

1- 4—Tea Assn. Convention, Greenbriar, White Sulphur Springs, Va.

15-18—International Assn. of Milk and Food Sanitarians, Inc., annual convention, Hotel Dennis, Atlantic City, N. J.

16-21—Milk Industry Foundation and Dairy Industry Supply Assn., 43rd annual convention and 17th exposition, Auditorium, Atlantic City, N. J.

18-20—International Assn. of Ice Cream Mfg., 46th annual convention, auditorium, Atlantic City, N. J.

23-25—Packaging Institute, 12th annual forum, Hotel Commodore, New York City.

23-28—National Honey Week.

—End

— one of 6 essentials you're sure of with Inland Steel Containers

Every detail of Inland Steel Containers is designed with *star* features — from positive closures to protective beads, welded seams, and double-seam chimes — to give your products the unsurpassed protection of a leak-proof, sift-proof and air-tight container.

And that is just one of six basic essentials that make experienced buyers consider Inland the best container source for any product. Besides superlative *design strength,* you are sure of . . . the unmatched *durability of steel* . . . a *variety of closures* to meet every need . . . *full-color lithography* that makes every container a "salesman" . . . *protective Hi-Baked linings* for special product problems . . . and selection from *a line that is really complete!*

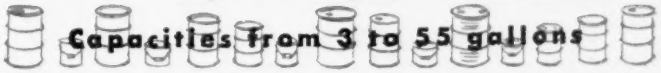
Insist on a source that offers all these essential container features. Choose from Inland's complete line of standard drums and pails, or submit your special problems to our engineering staff.

A-4

INLAND STEEL CONTAINER COMPANY

6532 South Menard Avenue • Chicago 38, Illinois

Chicago • Jersey City • New Orleans



Capacities from 3 to 55 gallons

CHEVROLET

ADVANCE-DESIGN TRUCKS

POPULARITY LEADERS Chevrolet trucks are the favorites by far! In every postwar year truck users have bought more Chevrolets than any other make. And that's proof of the owner satisfaction they have earned!

PERFORMANCE LEADERS Chevrolet trucks give you high pulling power over a wide range of usable road speeds . . . cut down total trip time with high acceleration on the straightaway.

PAYLOAD LEADERS Careful design and rugged construction permit you to haul more goods more miles—at lower cost per ton mile! You enjoy real savings on operating and repair costs.

PRICE LEADERS You're money ahead with Chevrolet trucks! Chevrolet's rock-bottom initial cost—outstandingly low cost of operation and upkeep—high-trade-in value, all add up to the lowest price for you.

Packed with VALUE... *Primed with* POWER

Chevrolet Advance-Design trucks have everything it takes —and plenty to spare. Rugged construction to withstand the wear and tear. Handling ease and comfort to lighten the load of a day's work. And more power than ever! Two great Valve-in-Head engines—the Loadmaster 105 h.p. and the Thriftmaster 92 h.p.—make these the most powerful trucks Chevrolet has built! Yes, these new jobs bring you peak value—and at a low price. They cost surprisingly little to buy, to run and maintain. That's why Chevrolet trucks outsell them all!

CHEVROLET MOTOR DIVISION, *General Motors Corporation*, DETROIT 2, MICH.

AHEAD WITH ALL THESE PLUS VALUES

• TWO GREAT VALVE-IN-HEAD ENGINES: the New 105-h.p. Loadmaster and the Improved 92-h.p. Thriftmaster—to give you greater power per gallon, lower cost per load • THE NEW POWER-JET CARBURETOR: smoother, quicker acceleration response • DIAPHRAGM SPRING CLUTCH for easy action engagement • SYNCHRO-MESH TRANSMISSIONS for fast, smooth shifting • HYPOID REAR AXLES—5 times more durable than spiral bevel type • DOUBLE-ARTICULATED BRAKES—for complete driver control • WIDE-BASE WHEELS for increased tire mileage • ADVANCE-DESIGN STYLING with the "Cab that Breathes" • BALL-TYPE STEERING for easier handling • UNIT-DESIGN BODIES—precision built.

Changes in Food Supplies

Production

CREAMERY BUTTER production in May, estimated at 156,195,000 lb., was off 3 percent from May, 1949, and indicated an April-May increase of only 21 percent compared with increases of 29 percent both a year ago and in the five-year seasonal average. May production, however, was 7 percent above the 1944-48 average for the month.

AMERICAN CHEESE output in May was estimated at 104,535,000 lb., which was 10 percent below the May level last year, but 1 percent above the five-year average for the month. The April-May increase was 24 percent as against 34 percent in 1949 and a five-year average upturn of 33 percent.

ICE CREAM produced in May came to 55,070,000 gal., 2 percent under May, 1949, but 1 percent larger than the five-year average for the month. The April-May increase was a healthy 35 percent compared with 26 percent last year and 17 percent for the five-year average.

NONFAT DRY MILK SOLIDS produced in May totaled 113,000,000 lb., down 8 percent from a year earlier, but 27 percent above the five-year average for the month. Output for January through May reached 425,600,000 lb., up 2 percent from the same 1949 period.

DRY WHOLE MILK turned out in May was estimated at 11,410,000 lb., down 17 percent from May, 1949 and 46 percent under the five-year May average. With a total of 50,611,000 lb. for the first five months, production was running 10 percent below last year.

LIQUID EGG production totaled 126,194,000 lb. during May, a 28 percent increase over May, 1949, but 15 percent under the five-year average for the month. Of the total, 19,051,000 lb. represented dried egg production—compared with 7,784,000 lb. produced in May, 1949—and 57,964 lb. were frozen. Frozen egg output was 17 percent under May, 1949 and 34 percent less than the five-year average.

POULTRY canned or used in canning during May was the second highest for the month on record. The total of 13,014,000 lb. was well above the 11,240,000 lb. turned out during May, last year and compares with the five-year May average of 12,025,000. The record output for May is the 20,011,000 lb. produced in 1945.

CHICKS produced during May totaled 211,639,000, 18 percent under May, 1949 and 12 percent below the five-year average for the month. Output during the first five months was 6 percent under the same period last year.

CANE AND BEET SUGAR production throughout the world is now estimated at about 38,000,000 tons, which would be about 2 percent above last year's record crop and 10 percent above the 1935-39 average. Current output is judged to be about 4 percent greater than indicated last fall.

Stocks

Canned Fruits and Vegetables in canners' hands June 1, compared with 1949, were reported as follows by NCA:

	(000 omitted) Actual Cases 1949	1950
Peas	4,985	2,141
Sweet corn	6,245	10,078
Green and wax beans	573	2,328
Tomatoes	3,632	2,600
Tomato juice	7,630	5,032
Apple sauce	299	1,274
	(Basis 24/½'s)	
Peaches	3,518	2,542
Pears	788	597
Apricots	1,522	540
Sweet cherries	65	316
	(Thousands of dozens)	
Baby food	44,289	44,768

Storage

PUBLIC COOLER occupancy rose 2 points during May, reaching 56 percent on June 1. Although well below average for the date, occupancy was 6 percent above June 1, 1949.

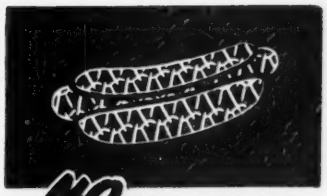
FREEZER occupancy, at 64 percent on June 1, was down 3 points from a month earlier and was 6 points below average for the date. Occupancy, however, was 5 points above the June level a year ago.

FROZEN FISH AND SHELLFISH held in storage June 1 totaled 95,888,602 lb., compared with 91,453,047 lb. held June 1, 1949.

Indexes

Business Week's index of business activity dipped to 216.0 for the week ending July 8, compared with 217.5 for the previous week. It was 213.4 a month earlier, and 178.8 a year ago.

THE COMMODITY INDEX on foods, compiled by the *New York Journal of Commerce*, stood at 194.0 for the week ending July 14. For the previous week it was 190.8, for June, 182.5, and for July 1949, 179.3.



A Cambridge Balanced Belt whisks frankfurters and bacon through the packaging operation. Open mesh and stainless steel construction permits caustic or steam cleaning and meets all sanitary requirements.

with *Cambridge*
WIRE BELTS

Cambridge Wire Belts are efficient workers in your field. They serve in heat, cold, corrosive and wet processes; through packaging and assembly operations—moving quickly or slowly at constant or varying speeds. Wherever a material can be processed during movement, a Cambridge belt can, and does, save time, money and floor space.

Cambridge offers you a modern engineering staff with experience in your field and skilled workmen to produce the right belt in the correct mesh and weave, metal or alloy to perform your operation better . . . for longer.

Consult your Cambridge representative—look under "Belting, Mechanical" in your Classified Telephone Directory or write direct.

FREE BOOK—Famous throughout industry as the most valuable reference work on belts and conveyor systems. Write for your free copy . . .

Cambridge Wire Cloth Co.
Dept. Q • Cambridge 8, Md.

Wire cloth in rolls. Also specialized wire fabrications

OFFICES IN PRINCIPAL INDUSTRIAL CITIES

SEE VICTOR CHEMICAL WORKS' EXHIBIT

BOOTH NUMBERS 103, 104, 105

NATIONAL CHEMICAL EXPOSITION

Chicago Coliseum

September 5, 6, 7, 8, 9, 1950

VICTOR CHEMICAL WORKS
141 West Jackson Blvd., Chicago 4, Illinois

A. R. Maas Chemical Co., Division
4570 Ardine Street, South Gate, California

Men, Jobs, Companies

JOSEPH A. LEE has been appointed first vice-president of Standard Brands, Inc. He will be in charge of subsidiary company operations. Albert R. Fleischmann succeeds him as general sales manager.

K. M. RICHARDSON has been promoted to general superintendent of Swift & Co., Chicago, where he'll be responsible for all operations. Starting with company in 1911, he succeeds J. E. Wilson, retired.

HARRY J. SCHLICHTING was elected president of the American Spice Trade Assn. at its recent 44th annual meeting. John J. Frank was elected vice-president, and Robert F. Sayia, to the office of treasurer.

W. F. GEDDES, chief of Agricultural Biochemistry Div., Univ. of Minnesota, was presented the Thomas Burr Osborne Award medal at the recent 35th annual American Assn. of Cereal Chemists meeting.

Industry

American Assn. of Candy Technologists elected the following officers at its second annual meeting: G. Lloyd Latten, Schutter Candy Co., President; Lester Bettes, Imperial Candy Co., 1st Vice-President; Charles Carilli, Edgar P. Lewis & Sons, Inc., 2nd Vice-President; and Hans F. Dresel, Felton Chemical Co., Inc., Secretary-Treasurer.

American Corn Millers Federation re-elected the following officers for 1950-51: S. H. Werner, Illinois Cereal Mills, President; C. R. Martin, Quaker Oats Co., 1st Vice-President; R. B. Evans, Evans Milling Co. 2nd Vice-President; R. C. Huth, Chas. A. Krause Milling Co., Treasurer; and Harry Hunter, Chicago, Secretary.

Assn. of Operative Millers elected its 1950-51 officers as follows: L. E. Collier, National Biscuit Co., President; C. R. Veeck, Eagle Roller Mill Co., Vice-President; and G. S. O. Smith, Flour Mills of America, Inc., Treasurer. Donald Eber was appointed executive secretary.

Canadian Sugar Factories will have its $5,500,000 beet-sugar plant at Taber, Alberta, ready for production by mid-September.

Charlotte Refining Co., Charlotte, N. C., a new company, plans to begin refining vegetable oils at its new plant by September. G. D. Patterson is president while Howard M. Duvall, Jr., is vice-president.

Durkee-Mower, Inc., recently dedicated its new $200,000 plant and office building in East Lynn, Mass., on the occasion of its 30th anniversary.

Gerber Products Co. has announced plans to erect a $5,000,000 plant in Rochester, N. Y., to serve eastern seaboard sales outlets.

Hines-Park Foods, Inc., Ithaca, N. Y., has placed Duncan Hines premium ice cream on sale in the Lehigh Valley area of Pennsylvania, with nationwide distribution planned subsequently.

Ice Sickle Frozen Food plant at Fresno, Calif., was destroyed by fire in June, with loss estimated at $650,000.

International Institute of Milling Technology elected its 1950-51 officers as follows: Esli A. Marsh, St. Regis Paper Co., President; David P. Swan, Dixie Machinery Mfg. Co., 1st Vice-President; and J. H. Waldron, Sprout, Waldron & Co., 2nd Vice-President.

The Kroger Co. has opened its new $1,000,000 warehouse in Madison, Wis. A fleet of 50 trucks will be operated.

Minute Maid Corp. has announced the following appointments in its engineering department: Wallace F. Mantey, assistant chief engineer; Walter H. Harte, process engineering; George M. Litsinger, structural and mechanical engineering; Raymond A. Reynolds, construction engineering and George E. Bissell, electrical engineering.

Polk Packing Assn.'s plant at Eloise, Fla., has been ravaged by fire with damage estimated at $2,500,000.

Seymour Packing Co. has announced the following reorganization of its management: J. L. Perry, president; J. G. Odell, vice-president; and chairman of the board, Harold J. O'Connell.

Personnel

Robert H. Bennett has been appointed to the newly-created post of assistant general manager of the Maxwell House Div., General Foods Corp.

Lee S. Bickmore has been named vice-president in charge of sales for National Biscuit Co.

W. R. Bowden has been named vice-president and general manager of Horlick's Corp. T. C. Thompson is assistant general manager.

Ralph W. Burger has been elected president of the Great Atlantic & Pacific Tea Co. of New Jersey.

George L. Clements has been promoted

11 Machines

FOR SHELLING, SEPARATING, PROCESSING

Peanuts

Whenever you see peanuts in bags, boxes, bars, or butter, you can be pretty sure that Bauer machines performed some operations on them. This is because the large variety of Bauer machines is widely used. All are shown in our Catalog No. 50; each is completely described in the designated bulletin.

MACHINE	BULLETIN
No. 201 Peanut Cleaner	0-3A
No. 402 Peanut Sheller	0-5
No. 200 Separator-Grader	0-10-A
No. 322 Radiant Roaster with Color Controller	F-1
No. 248 Butter Mill	F-2
No. 341 Split Nut Blancher	F-5-A
No. 346 Whole Nut Blancher	F-6
No. 303 Butter Mill	F-9
No. 305 Metering Unit for FIX and FIX-M	F-11
No. 148-1 Butter Texturizer	F-14A
No. 365 Nut Granulator	F-15

Ask for any or all of the bulletins and the catalog. Write now while you're thinking about it.

Bauer

THE BAUER BROS. CO.
1740 Sheridan Avenue
SPRINGFIELD, OHIO

Guardians OF THE NATIONS FOODS

DETROIT
140 WABASH AVE.
ZONE 16

CHICAGO
2101 W. PERSHING RD.
ZONE 9

UNITED STATES COLD STORAGE

Four Modern Fortresses For Guarding The Nation's Foods

DALLAS
1114 WOOD STREET
ZONE 2

WRITE FOR DETAILS

KANSAS CITY
500 EAST THIRD ST.
ZONE 5

ROSS COVERT has been elected a vice-president and director of American Home Foods, Inc. He will direct the Pacific coast operations of the food and household divisions.

to vice-president of Jewel Tea Co., Chicago. He will serve as assistant to the president.

Lloyd L. Footh has been named president of Martha Washington Candies Co., Chicago.

J. C. Davidson, Jr., has been named secretary-manager of the Oklahoma Butter Institute and manager of the American Dairy Assn. of Oklahoma.

Edward J. Grier will succeed Robert M. Owthwaite, retired, as manager of John Morrell & Co.'s plant in Topeka, Kan.

Paul Jones and **Donald Tubbs** have been elevated to vice-presidencies of Hammond Standish & Co., Detroit. Former heads marketing development, latter is in charge of operations.

Floyd M. Keller of Associated Milk Dealers, Chicago, has been named president of Associated Illinois Milk Sanitarians.

Luther S. Langley has been appointed plant manager for White Provisions Co., Atlanta, Ga., succeeding G. C. Dinwoodie.

Herbert A. MacArthur has been elected president of H. C. Brill Co., Inc., Newark, N. J. Harry C. Brill, Jr., is a new vice-president, and Charles H. Coons is secretary-treasurer.

Charles R. McCormick, president of McCormick & Co., was elected vice-president of the 33rd International Labor Conference at Geneva, Switzer-

land. He represented the NAM and U. S. Chamber of Commerce.

Kenneth Morgareidge has been appointed chief chemist of Food Research Laboratories, Inc., Long Island City.

Fred W. Paget has been elected vice-president and director of marketing of the Carr-Consolidated Biscuit Co., Wilkes-Barre, Pa.

Joseph J. Quilligan, former president of the M&R Dietetic Laboratories, has become special consultant to Charles F. Kieser, vice-president in charge of Borden Co's special products division.

John L. Tarkington has been named manager of the Shreveport La., branch of Wilson & Co., succeeding W. J. Somarindyck, deceased.

Russell D. Wirth has been elected president of Red Star Yeast & Products Co., Milwaukee, Wis.

Associated Industry

Albert & Davidson Pipe Corp., Brooklyn, jobber in pipe, valves and fittings, has changed its name to Davidson Pipe Co., Inc.

Bakelite Div., Union Carbide & Carbon Corp., plans construction of a plant at South Charleston, W. Va., to produce Vinylite dispersion resin VYNV.3.

The Baker-Raulang Co., Cleveland, has elected H. Dudley Swim chairman of board, Clarence M. Taylor chairman of executive committee, and John R. Morrill vice-president in charge of sales.

Continental Can Co. is building a new plant in Auburndale, Fla., expected to be in operation by late fall.

Crane Co., Chicago, announces promotion of Joseph E. Bradbury to the post of manager of alloy sales section of the company's valve and fitting department.

De Laval Separator Co. is moving its executive staff and general offices from New York City to Poughkeepsie, N. Y.

Gair Co. Canada, Ltd., has announced election of Charles E. Whitten as president and general manager. He succeeds George W. Brown, deceased.

Hapman Conveyors, Inc., Detroit, and The C. H. Dutton Co., Kalamazoo, Mich., have merged.

Here's what
IN-PLANT CHLORINATION can do

"Member of National Canners Association"

BAKER CANNING COMPANY

Theresa, Wisconsin

April 4, 1949

PACKERS OF NUMBER 10 TINS
Wisconsin Quality
Peas
Whole Kernel Corn

Address all Communications to Theresa, Wisconsin

Wallace & Tiernan Co., Inc.
Newark 1, New Jersey

Gentlemen:

We have been using In-Plant Chlorination for a few years, and feel that this piece of equipment is just as important in a canning factory as any other piece of equipment used in the processing of canned foods.

The first year we installed In-Plant Chlorination we had chemists make bacteria counts, and checks at approximately fourteen points throughout the plant, such as picking table belts, flume systems, washers, blanchers, fillers, closing machines etc. In making these tests we did not use In-Plant Chlorination for one week, and the next week we used In-Plant Chlorination in order to make comparisons as to bacteria count.

The reduction in bacteria count, between the two operations is almost unbelieveable. We found that by using this equipment properly, and increasing the dosage at clean-up time, we eliminated bacteria at many of the check points. One cannot, however, install In-Plant Chlorination and forget about a good housekeeping job. This would be an error, indeed.

However, by having In-Plant Chlorination, and doing a good job of house-cleaning, one can eliminate the building up of bacteria in most any piece of equipment. We do find that by using In-Plant Chlorination the clean-up time necessary at clean-up periods is practically cut in half.

You may use this letter in part or in full - for any purpose you care to.

Yours very truly,

BAKER CANNING COMPANY

By Robert Robin

RDB:eal

In-Plant Chlorination, engineered by Wallace & Tiernan, can help your plant, too. Bacterial counts are reduced, odors controlled, and on-the-line time for processing equipment increased when you use this proven method.

Call your nearest W & T Representative now for complete information.

Other services by Wallace & Tiernan Associated Companies include Merchen Feeders for precision blending BY WEIGHT; Richmond Sifters for all separating problems involving powdered or ground materials; and Richmond Permaflux Magnets for the complete elimination of any ferro-metallic contamination of your food line.

WALLACE & TIERNAN
COMPANY, INC.
CHLORINE AND CHEMICAL CONTROL EQUIPMENT
NEWARK 1, NEW JERSEY • REPRESENTED IN PRINCIPAL CITIES

I-33

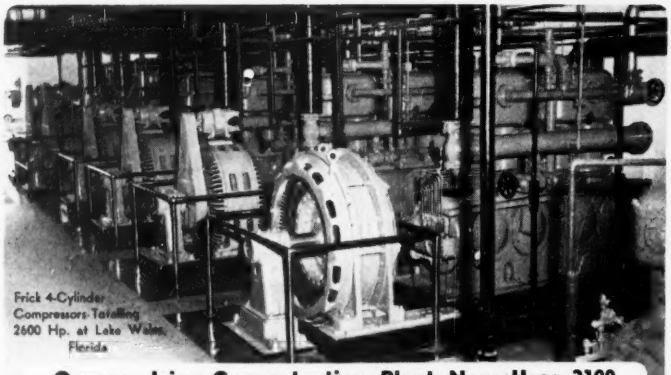
Eastern pickle packer speeds up brine-filling operation

● "The right amount of brine . . . no air space . . . no contamination," reports one Eastern pickle packer, when brine-filling process is handled on Cyclone Stainless Steel Flat Wire Conveyor Belt. After jars pass through brine tunnel, they are then capped, washed, dried and labeled on the same belt. Production schedules are speeded up . . . production costs are lowered.

One of our three types of belts—Chain Link, Flat Wire, Flex-Grid—will probably make the operation of your plant more efficient, more economical. Why not consult one of our experienced engineers and write for our free catalog #4.

CYCLONE FENCE DIVISION
(American Steel & Wire Company)
DEPT. H-80, WAUKEGAN, ILLINOIS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

CYCLONE METAL CONVEYOR BELTS
UNITED STATES STEEL



Frick 4-Cylinder Compressors Totalling 2600 Hp. at Lake Wales, Florida

Orange Juice Concentrating Plant Now Uses 3180 Horsepower of Frick Refrigeration

The Florida Citrus Canners Cooperative at Lake Wales, largest of its kind in the world, depends on this battery of six Frick refrigerating machines for heavy-duty heat-pump service.

Hot gas, discharged from the compressors, heats the orange juice, driving off excess moisture as low-pressure steam. This is condensed by the "cold" side of the refrigerating system, and the heat is efficiently recovered.

Nine other Frick compressors chill, quick-freeze, and store the concentrated juices.

The original capacity of the plant has increased nearly six times over, in two years.

Frick equipment was the pioneer and is the recognized leader in this new field. Whether you need air conditioning, ice-making or refrigerating equipment, you get the most satisfaction and economy from machinery carrying the Frick trademark. Let us submit estimates on your requirements.

DEPENDABLE REFRIGERATION SINCE 1882
FRICK CO.
WAYNESBORO, PENNA. U.S.A.
Also Builders of Power Farming and Sawmill Machinery

MARTIN L. MORICI, formerly sales manager of Herschel California Fruit Products Co., has been appointed general manager of Madonna Foods, Inc. Latter company recently purchased Riverbank Canning Co., Calif.

Milprint, Inc., has begun construction of a new plant in Milwaukee to house company's complete operations in that city.

N. V. Chemische Fabriek "Naarden", Naarden, Holland, has formed a subsidiary company in London to expand its foreign activities.

Pressed Steel Tank Co. has appointed Albert S. Cheyne as manager of its new Kansas City office.

Yarnall-Waring Co., Philadelphia, has made the following sales appointments: Lytton C. Musselman, Los Angeles; Power Engineering Co., Salt Lake City; Wallace Agren, Chicago; R. W. Westlake, Cleveland; and Andrew Ritter, Detroit.

Deaths

Donald D. Davis, 61, former president of General Mills, Inc., Minneapolis—June 7, of paralytic stroke.

Charles A. Douglas, former vice-president of Certo Corp.—May 26.

Ernest M. Gallup, 74, retired executive of Norris Grain Co.—June 18.

Alexander J. Horlick, 76, former president of Horlick Malted Milk Corp., Racine, Wis.—June 6.

Lloyd H. McClendon, 44, assistant research director for Mars, Inc., Chicago—June 1 of a heart attack.

Charles L. Wirth, 51, president Red Star Yeast & Products Co., Milwaukee—May 21. —*End*

For the man who wants things RIGHT!

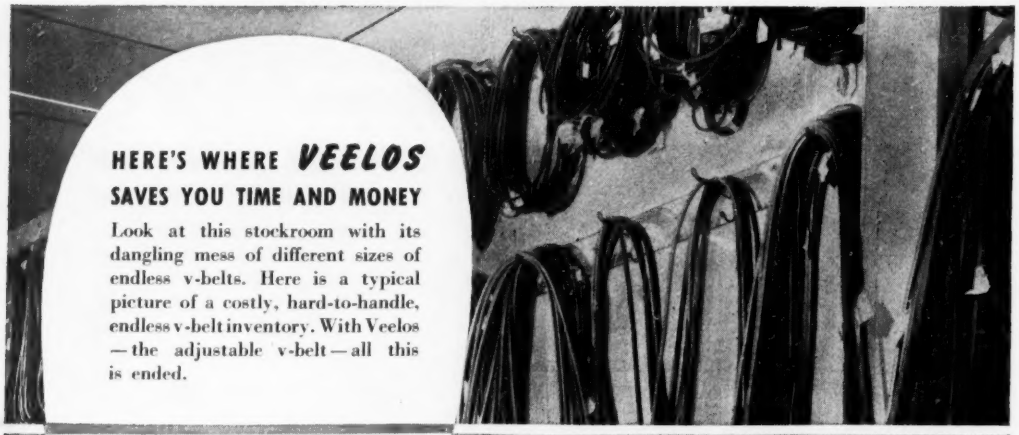
Those who have an appreciation for the finer things . . . the niceties of living . . . are likely to choose the best. That's why Grandee Maraschino Cherries are so often found in the right company.

Grandee Maraschino Cherries are packed by Mawer-Gulden-Annis, Inc., Brooklyn, N. Y. For this excellent product they have selected Crown Screw Caps as closures. What more need be said?

When you have a sealing problem . . . do as so many other packers do . . . bring it to Crown, where a wealth of sealing experience and the most modern laboratory facilities are at your disposal. Crown Cork & Seal Company, Baltimore 3, Maryland. *World's Largest Makers of Metal Closures.*

CROWN CLOSURES

Approved by millions of housewives



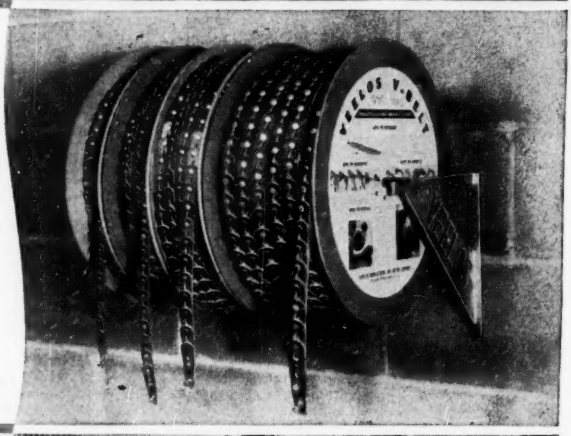
HERE'S WHERE *VEELOS* SAVES YOU TIME AND MONEY

Look at this stockroom with its dangling mess of different sizes of endless v-belts. Here is a typical picture of a costly, hard-to-handle, endless v-belt inventory. With Veelos — the adjustable v-belt — all this is ended.

WITH *VEELOS*, ANY BELT SIZE IS ALWAYS ON HAND

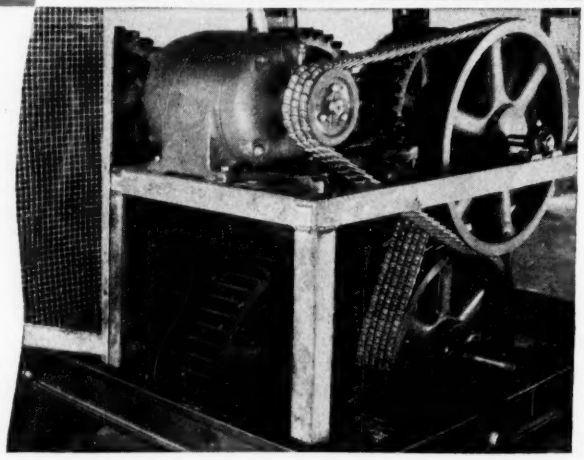
These four reels of Veelos alone can *replace* up to 316 sizes of endless v-belts in the O, A, B and C widths. No more stockroom troubles, no more replacement headaches because Veelos is *always* ready—in the widths you require.

If you are interested in reducing your v-belt costs and increasing your production efficiency, you should have a Veelos Data Book. For free copy of this illustrated book complete with engineering information write*



VEELOS ASSURES MAXIMUM MACHINE PRODUCTION

Veelos is easy to install *without* dismantling outboard bearings. Veelos runs true for vibrationless, full power delivery. Because Veelos is adjustable, uniform belt tension is easily maintained.



VEELOS
THE LINK
V-BELT

ADJUSTABLE TO ANY LENGTH • ADAPTABLE TO ANY DRIVE

Made in all widths in three types: regular, oil-proof, static conducting. Also double V in A and B. Packaged on reels in 100-foot lengths. Sales engineers in principal cities; over 350 distributors throughout the country. Veelos is known as VEELINK outside the United States.

***MANHEIM MANUFACTURING & BELTING COMPANY, MANHEIM, PA.**

Books

Growth of Nutrition Into a Science Carefully Traced and Evaluated

THE NUTRITIONAL IMPROVEMENT OF LIFE. *By Henry C. Sherman. Published by Columbia University Press,* 2960 *Broadway, New York* 27, *N. Y.,* 1950. 270 *pages;* 5¾x8¾ *in.; cloth. Price,* $3.75.

Whether you think of nutrition as a byproduct of food manufacture or vice-versa, the subject is certainly one that should interest the food producer.

This work traces the story of nutrition's growth during the past half-century—a period that saw it develop into a recognized autonomous science. Emphasis, however, is not so much upon how these successive advances were made as it is upon how each contributed to the next step and what all mean to present and future generations.

Naturally, as with any rapidly moving science, the more recent discoveries require the most attention. Both because there are more of them and because their significance is more apparent, the nutritional developments during and since World War II take up more than half the book's pages.

An appendix provides records of actual meals to illustrate how the book's nutritional principles have worked out for those who cannot control every meal and must, therefore, "even-up" their food consumption to secure adequate nutritional benefits. This appendix alone might offer some reliable hints to alert food producers and to their promotion departments.

The author is Mitchill Professor Emeritus of Chemistry at Columbia University, and the 1950 recipient of the Borden Award in Nutrition. It is Dr. Sherman's name that is identified with the "Sherman unit" used in measuring vitamins.

AMA on Packages

TECHNICAL DEVELOPMENTS IN PACKAGING. *Price,* 50*c.* IMPROVING THE EFFICIENCY OF PACKAGING PRODUCTION. *Price* 75*c.* COST REDUCTION IN MATERIALS HANDLING AND SHIPPING. *Price* $1. *All are in Packaging Series, published by American Management Assn.,* 330 *W.* 42*nd St., New York* 18, *N. Y.,* 1950. *Each is* 6 x 9 *in., paper covered.*

First named discusses plastic bonding technics, insect-free packaging, and packaging uses of polyethylene. Second concerns efficiency factors, also includes a paper on the outlook for packaging materials. And last covers handling technics and equipment, along with descriptions of packaging and packing for shipping.

Sugar Chemistry

THE STRUCTURE AND CONFIGURATION OF SUCROSE. *By Irving Levi and Clifford B. Purves. Published by Sugar Research Foundation,* 52 *Wall St., New York* 5, *N. Y.,* 1950. 37 *pages;* 6x9 *in.; paper. Free.*

In contrast to the centuries through which practical processing of sugar has developed, knowledge of its chemical and physical properties had to await the cultivation of modern organic chemistry. The story of the progress made by the organic chemist working with sugar is told in this little volume, which is reprinted from *Advances In Carbohydrate Chemistry* (Vol. IV) by special arrangement with The Academic Press.

Structural organic chemistry raised both new and previously unconsidered questions about the exact constitution and configuration of sugar. If full utilization of this valuable substance is to be realized, these questions must be understood.

This book attempts to clarify many of these points and should prove a valuable asset to sugar users as well as sugar producers.

Food Analyst's Manual

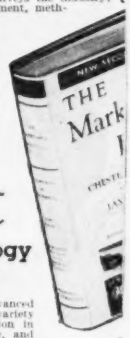
LABORATORY MANUAL AND WORK BOOK IN MICROBIOLOGY OF FOODS. *By Fred W. Tanner. Published by The Gerrard Press, Champaign, Ill.,* 1950. *Approx.* 500 *pages;* 8½ x 11 *in.; Loose leaf. Price,* $4.75.

Primarily prepared as a student's lab manual and work book, this unusual edition fences in the important developments in food analysis, in standards, and in standard methods of procedure.

In the book's organization, considera-

THE MARKET MILK INDUSTRY

1. A practical book for milk plant operators, market milk producers, dairy inspectors, and health department officials. Surveys the industry; takes up fundamentals, equipment, methods, costs, sanitary standards, production, distribution, laboratory tests, and inspection. Includes figures, examples of successful methods, latest data on high-temperature short-time pasteurization . . . ; use of fiber containers; lists milk plant and equipment depreciation rates; and analyzes revised tests for composition and quality of milk products. **By C. L. Roadhouse, Univ. of California; and J. L. Henderson, Golden State Co., San Francisco, Calif. 2nd Ed. 716 pgs., 167 illus. $7.00.**



Odors: Physiology and Control

2. This book summarizes all advanced knowledge of odors; includes a variety of measures for odor elimination in food, in industry, in the home, and on the person. Covers theory and little known facts about odors; gives you a working knowledge of olfactory physiology and control; discusses the relationship between health and odors, the control and abatement of odor nuisances, and legal aspects pertaining to such control. **By Carey P. McCord, Indus. Health Conservancy Labs., Detroit; and Wm. N. Witheridge, Gen. Motors Corp., Detroit. 397 pgs., 91 illus. $6.50.**

FLAVOR

3. A handy source of reference information on every aspect of flavor and taste. Includes the chemistry of flavoring agents and condiments . . . methods of detection, correction, and prevention of undesirable flavor in commercial products. Covers everything from natural sources of taste, essential oils of flavor interest and flavor changes on storage, to beverage appraisal by taste and commercial quality scoring. **By C. E. Crocker, Arthur D. Little, Inc., 172 pages, 33 illus. $3.50.**

FOOD PLANT SANITATION

4. This practical book helps you set up and maintain safe sanitation practices throughout your plant; gives tested methods to get best results in food processing; protects you from legal liabilities. Covers practices that meet Federal Food, Drug and Cosmetic Act; plant layout and design; selection of packaging materials. Shows how to control pest contamination; maintain employee interest; cut down spoilage. **By Milton E. Parker, Counselor in Food Production Development. 434 pages, 129 illus. $6.00.**

SEE THESE BOOKS 10 DAYS FREE

McGRAW-HILL

McGraw-Hill Book Co., Inc. 330 W. 42nd St., New York

Send me book(s) corresponding to numbers encircled below for 10 days' examination on approval.

In 10 days I will remit for book(s) I keep, plus few cents for delivery, and return unwanted book(s) postpaid. (We pay for delivery if you remit with this coupon; same return privilege.)

1 2 3 4

Name .....

Address .....

City ..... Zone..... State.....

Company .....

Position Food-8-50

This offer applies to U. S. only.

DOWNINGTOWN

is experienced in Designing and Fabricating Heat Exchangers with KARBATE PARTS

Karbate combats corrosive action in this Heat Exchanger. A multi-pass cooler for a corrosive liquor . . . the liquor passes through the tubes in multi-pass and is cooled by water circulating through the baffled steel shell.

It is a dense, pure graphite bonded carbon. It is highly resistant to the corrosive action of numerous liquids, vapors and gases. While its initial expense may be high, it is in many cases the least expensive material for the job, for these reasons: 1. In many cases Karbate outlasts even high alloys by as much as several times. 2. Karbate tends to be non-scaling. Thus, often a Karbate unit may do a given job with less surface than that required by a material which supports scaling.

We also specialize in the design and fabrication of heat exchangers from the following materials:

- KARBATE
- ALUMINUM
- BRONZES (EVERDUR PHOSPHOR BRONZE, 70-30 CUPRO-NICKEL, ETC.)
- NICKEL AND MONEL
- FINNED TUBE HEAT EXCHANGERS
- BIMETALLIC TUBE UNITS

DOWNINGTOWN IRON WORKS
DOWNINGTOWN, PA.
HEAT EXCHANGERS

tion of each food is completed as a unit. Separate sections are used to subdivide the work where necessary. With the pages left unbound, the student or laboratory worker may file his own notes with each food unit as he proceeds.

The work represents an exhaustive effort in compilation and organization. It should prove highly valuable to the food analyst, no matter in what division of the field he might be working.

Widely known and highly regarded among food technologists, the author is the former head of the department of bacteriology, University of Illinois, and he is now professor of bacteriology at the same university.

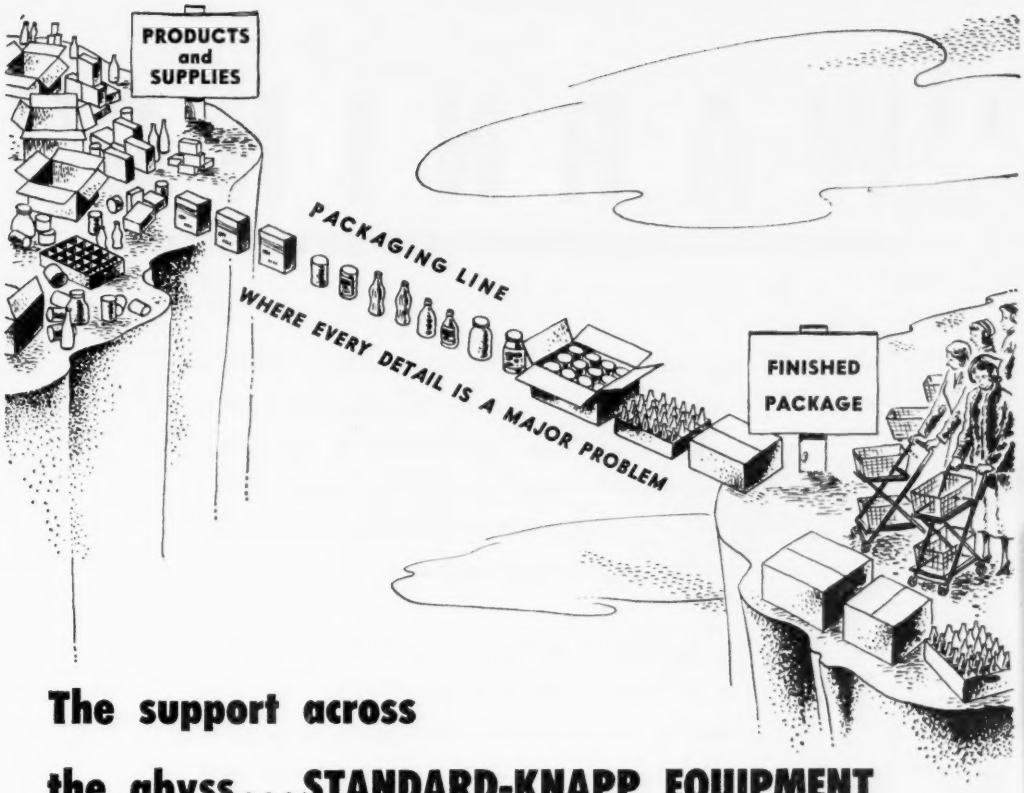
Government Publications

SURVEY OF GERMAN WARTIME FOOD PROCESSING, PACKAGING AND ALLOCATION. *Office of Technical Services, PB-99020. 550 pages, including graphs and tables. Price $68.75 in photostat form, $9 in microfilm (complete). Separate sections are available as follows: "Part I. Canned Foods and Food Cans", $12.50 in photostat, $4.25 in microfilm; "Part II. Frozen Foods", $8.75 in photostat, $3.00 in microfilm; "Part III. Dehydrated Foods", $5.00 in photostat, $2.25 in microfilm; "Part IV. Processed and Packaged Meats and Meat Products," $11.25 in photostat, $3.75 microfilm; "Part V. Milling and Baking," $12.50 photostat, $4.25 microfilm; "Part VI. Edible Fat and Oils Industries", $5.00 photostat, $2.25 microfilm; "Part VII. Specialty and Saccharine Products", $3.75 photostat, $2.00 microfilm; "Part VIII. Feeding the German Army", $7.50 photostat, $2.75 microfilm; "Part IX. Wartime Food Research Activities", $3.75 photostat, $2.00 microfilm; and "Part X. Civilian Food Rationing in Wartime", $1.25 photostat, $1.25 microfilm.*

These recently issued documents are available, at the prices indicated, from the Superintendent of Documents, Government Printing Office, Washington 25, D. C. When no price is indicated, the pamphlet is free and should be ordered from the Bureau responsible for its issue.

STABILIZERS AND EMULSIFIERS IN ICE CREAM. *By F. E. Potter, et al. Bureau of Dairy Industry, BDIM-Inf-91.*

FEED STATISTICS, INCLUDING WHEAT, RYE, RICE. *Bureau of Agricultural Economics, Statistical Bulletin No. 85. Mimeographed.* Gives detailed data through 1948. —End



The support across the abyss... STANDARD-KNAPP EQUIPMENT

Keep your packaging line modern and equal in tempo along its length . . . eliminate the headaches and omissions of complicated maintenance . . . and you add dollars to your profits.

Prevent the bald-spotted profit margins that result from overlooking such details. Forestall the price rises that unhinge your salesmen's knees and take the snap out of your distributors' merchandising. The formula is Standard-Knapp Packaging Machines.

Engineered and built by men who have made the details of the packaging line a lifetime career, our machines step up efficiency, reduce overhead, simplify production and maintenance and beat down break-even points.

Claims? Not a bit of it, as Standard-Knapp installations in hundreds of leading plants attest. Keep your production line constantly at peak efficiency in every detail. Install Standard-Knapp Packaging Machines — they're *Automatically Preferred.*

STANDARD-KNAPP DIVISION OF HARTFORD-EMPIRE COMPANY PORTLAND, CONNECTICUT

"WARNING"

IT has come to our attention, from reliable sources, that bottle, jar, can and container feeding units known commonly in the trade as Unscramblers, are being produced and offered for sale that infringe on our Patent Nos. 2389696, 2315880 and others pending. All infringements will be vigorously prosecuted.

This friendly warning is being publicly issued to both manufacturers and users, or potential users, and to protect the present users of Styl-O-Matic Straightline Unscrambling Tables purchased from us and now used by over 500 customers.

ISLAND EQUIPMENT CORP.

JOHN W. STILES, *General Manager*

27-01 Bridge Plaza North,
Long Island City 1,
New York

Catalogs, Bulletins

Free Literature—New Quick Way

Any of these very-latest catalogs, bulletins, circulars or folders will be sped to you gratis. It just takes a few seconds with a pencil. Suppose, for example, you want the literature marked "N" here on page 155. Simply take one of the special Reader Service postcards inside the front cover and circle the 155 N. Sign at the bottom and mail—no stamp needed. Then the material will be on its way to you.

Food Plant Equipment

Freeze-Drying Equipment A

Basic principles of freeze-drying and equipment available for production and research are presented in 16-page Catalog 706. Auxiliary machines are included.—*F. J. Stokes Machine Co., 5900 Tabor Rd., Philadelphia 20.*

Rotary Air Pumps B

Performance curves and specifications on 4- and 2-wing type air pumps and accessories are set forth in 16-page Catalog 450. Pumps are rotary positive type, designed for producing vacuums up to 29 in. and pressures up to 25 psi.—*Leiman Bros., Inc., Christie St., Newark 5, N. J.*

Herringbone Gear Reducers C

Horsepower rating tables for standard and semi-high speed single, double and triple herringbone gear reducers are contained in 28-page Bulletin H-HS. Overhung load rating tables, dimensions and weights, and a selection chart are included.—*De Laval Steam Turbine Co., Trenton 2, N. J.*

Centrifugal Pumps D

Engineering data and diagrams of single- and multi-stage centrifugal pumps are given in 12-page Bulletin 100, Models pump from 0 to 70 gpm. at 0 to 70 psi.—*Eastern Industries, Inc., New Haven, Conn.*

Pressure Reducing, Regulating Valves E

Latest improvements and additions on line of pressure reducing and regulating valves are outlined in 8-page Bulletin 283. An automatic reseating relief valve is also announced.—*A. W. Cash Valve Mfg. Corp., 666 E. Wabash, Decatur 60, Ill.*

Perforate Basket Centrifuge F

Dehydration of a wide variety of crystalline materials as accomplished by a horizontal axis perforate basket centrifuge is described in 8-page Bulletin 1257. Cyclic operations—loading, cake rinse, drying, unloading, screen rinse—are set forth in detail.—*The Sharples Corp., 2300 Westmoreland St., Philadelphia 40.*

Colloid Mills G

Two-page Bulletin 1301 gives specs on line of triple-action colloid mills for dispersions and emulsions.—*Troy Engine & Machine Co., Troy, Pa.*

Industrial Ventilating Fans H

Furnished in diameters from 3 to 5 ft., with capacities from 11,000 to 30,000 cfm., direct drive industrial ventilating fans are fully covered in 32-page booklet. Low-speed blowers are designed for quiet operation. And they are corrosion resistant.—*The Moore Co., 800 S. Missouri, Marceline, Mo.*

Automatic Clutches I

Complete line of automatic clutches is particularized in three new bulletins. General description and various applications are given in 8-page Bulletin 216. Bulletin 217, 4 pages, deals with applications on gasoline engines. Electric motor installations are covered in 4-page Bulletin 218.—*Automatic Steel Products, Inc., Canton 6, Ohio.*

Liquid Meters J

Drawings, specifications and accessories of liquid meters, designed for accurate measuring of liquid sugar and corn syrups into cold, warm or hot water, are presented in 4-page Bulletin 573-4.—*Neptune Meter Co., 50 W. 50 St., New York 20.*

Weigh Cans and Receiving Vats K

New line of factory-type weigh cans and receiving vats is outlined in 12-page Bulletin G-460. Single and double compartment types are listed. Dimensions are given.—*Cherry-Burrell Corp., 427 W. Randolph St., Chicago 6.*

Centrifugal Pumps L

Six-page foldout Bulletin 5520P-3 contains diagrammatic sketch of working components of centrifugal pumps, selection table, and dimensions.—*Fairbanks, Morse & Co., Fairbanks-Morse Bldg., Chicago 5.*

Five-Roll Chocolate Refiner M

Four-page folder outlines new model of 5-roll chocolate refiner. Direct, instead of "cut-and-try," control is featured.—*J. M. Lehmann Co., Inc., 550 New York Ave., Lyndhurst, N. J.*

Centrifugal Extractor N

Construction details and dimensions of 30-in. centrifugal unloading extractor are presented in 4-page Bulletin TC-5-50.—*Tolhurst Centrifugals Div., American Machine & Metals, Inc., E. Moline, Ill.*

Vacuum Fillers O

Rotary and single head vacuum fillers for freeflowing and non-freeflowing materials at speeds up to 300 a minute are set forth in 6-page folder.—*Pneumatic Scale Corp., Ltd., Quincy 71, Mass.*

Bacon Equipment P

Hydraulic press, slicer, and packing conveyor for bacon are illustrated in 8-page Folder 56A. Slicer is reported to produce 800 strips a min. with less than 2 percent waste.—*The Allbright-Nell Co., 5323 W. Blvd., Chicago 9.*

Automatic Packagers Q

Six models of automatic packaging machines for transparent packs are described in 8-page pamphlet. — *Transparent-Wrap Machine Corp., Route 17 & Henry St., Hasbrouck Heights, N. J.*

Magnetic Separators R

Applications, operations and designs of three models of non-electric, Alnico Permadrum magnetic separators are set forth in 8-

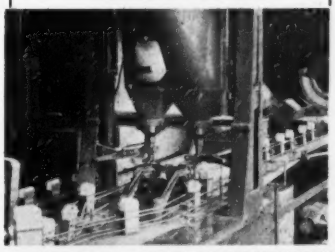
SYNTRON

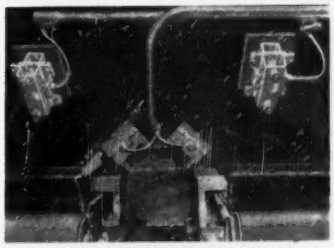
"Pulsating Magnet"

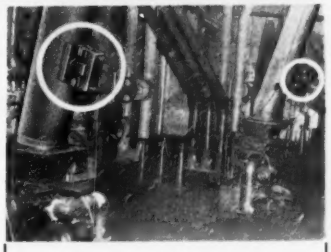
ELECTRIC VIBRATORS

with Adjustable Power

Make Stubborn Materials Flow Freely Through Bins, Hoppers and Chutes







Large or small—there is a Syntron Electric vibrator, or combination, that will make bulk materials flow freely through your most troublesome bins, hoppers and chutes.

Write for catalog data

SYNTRON CO.

460 Lexington, Homer City, Pa.

AJAX

Lo-Veyors prove that

the cheapest way to handle bulk material is NOT to handle it.

There is no money in moving bulk materials with wheelbarrows, shovels or other costly methods.

That's why production men are cutting costs and speeding up production with Ajax Lo-Veyors.

They are self-contained, vibrating conveyors ready to set in place and use. Easily installed on your floor, below your floor, or suspended from wall or ceiling.

Reciprocating drive unit is completely enclosed...no exposed bearings or idler pulleys subject to rapid wear.

Low first cost, low operating cost, low maintenance cost...it will pay you to look into Ajax Lo-Veyors.

AJAX FLEXIBLE COUPLING CO. INC.

28 English St., WESTFIELD, N. Y.

page Catalog C-1100-A. Selection data is included.—*Dings Magnetic Separator Co., 4740 W. Electric Ave., Milwaukee 14.*

Packless Expansion Joints A

Sizes, temperatures, pressure ratings, dimension and weights of line of corrugated packless expansion joints are described in 16-page Bulletin 35-51.—*American District Steam Co., N. Tonawanda, New York.*

Materials Handling

Roller and Wheel Conveyors B

Light and heavy duty wheels, and a complete line of conveyor rollers, ranging in diameter from 1 to 6¾ in. and from 50 to 16,000 lb. capacity are illustrated in 64-page Catalog 149.—*Mathews Convevor Co., Ellwood City, Pa.*

Conveyor Elevators C

Bulletin 344, of 8 pages, pictures and sketches typical installations of conveyor elevators. Construction of belting is illustrated. —*Stephens-Adamson Mfg. Co., Aurora, Ill.*

Aluminum Banana Boxes D

Eight-page leaflet depicts advantages of light weight, riveted aluminum banana boxes. Boxes nest and stack well. They have spring steel handles.—*The Republic Stamping & Enameling Co., Canton, Ohio.*

Racks E

Standard sections of Unistrut racks are illustrated in a large variety of assemblies, suitable for all types of plants, in 24-page Catalog 600.—*Unistrut Products Co., 1913 W. Washington Blvd., Chicago 7.*

Fork Lift Trucks F

Another in a series of certified job studies showing efficient materials handling with fork lift trucks is presented in 8-page Job Study 94.—*Towmotor Corp., 1226 E. 152 St., Cleveland 10.*

Hydraulic Lift Trucks G

Engineering sketches detail advanced features of new hydraulic lift truck in 8-page Bulletin 5031. Featuring a self-contained hydraulic system, truck's capacity is 5,000 lb. with 6-in. lift.—*Barrett-Cravens Co., 4639 S. Western Blvd., Chicago 9.*

Control Equipment

Dust Filters H

Operating principles, applications and specifications on Autoclean dust filters are given in 8-page Bulletin 491. Capacities range from 664 to 16,128 cfm.—*The Day Co., 810 3 Ave NE, Minneapolis 13.*

Metal Laboratory Appliances I

Holders, clamps and supports for laboratory equipment are shown in 24-page catalog. Pictures and prices of this "Castaloy" hardware are included.—*Fisher Scientific Co., 717 Forbes St., Pittsburgh 19.*

Exhibiting-Controlling Instruments J

New developments in exhibiting and controlling flow instruments are presented in 28-page Catalog 50. Basic devices for coupling a primary metering element to a secondary instrument are discussed, along with the magnetic clutch and electric impedance bridge transmitting systems.—*Fischer & Porter Co., Hatboro, Pa.*

Atmosphere Controllers A

Principles, applications and specifications on line of dryers, breathers and filters for atmosphere control are contained in 36-page Bulletin 106. Prices are listed.—*Pittsburgh Lectrodryer Corp., P. O. Box 1766, Pittsburgh.*

Electronic Standards Instruments B

Determination of safe minimum process standards for canneries through use of flush-mounted detachable thermo-couples is discussed in 4-page Data Sheet 3.2-12.—*Industrial Div., Minneapolis-Honeywell Regulator Co., Philadelphia 44.*

Laboratory Aids C

Details of new and improved laboratory aids, including Beckman automatic titrator, a USP-type tablet disintegration tester, and polarimeters, are set forth in *What's New for the Laboratory*, 24-page house organ.—*Scientific Glass Apparatus Co., 49 Ackerman St., Bloomfield, N. J.*

Thermometers D

Liquid-filled, vapor pressure and gas-filled types of thermometers are described in 44-page Bulletin T840. They are for recording, indicating, controlling and telemetering of temperatures.—*The Bristol Co., Waterbury 20, Conn.*

Water Conditioner E

Combining advantages of both hot process and zeolite softening is new water conditioner described in Bulletin 4801.—*Cochrane Corp., Philadelphia.*

D-C Indicating Amplifier F

Fully discussed in 8-page bulletin is the stabilized d-c indicating amplifier. Built for both production and research, it combines function of a direct-reading microvoltmeter, a preamplifier, and a high-sensitivity, short-period null point detector.—*Leeds & Northrup Co., 4908 Stenton Ave., Philadelphia 44.*

Potentiometer Controller G

Two-page Bulletin PO-1 describes a new potentiometer controller which operates with an "electronic link."—*Wheelco Instruments Co., 847 W. Harrison St., Chicago 7.*

Plant Supplies

Fine Screen Strainers H

Up-to-date data on screwed strainers, ⅛ to 3 in., and on flanged strainers ¼ to 5 in., is contained in 6-page Bulletin S-203.—*Yarnall-Waring Co., Mermaid Lane, Philadelphia 18.*

Cleanser for Bakeries I

Germicidal and cleaning materials for bakeries are recommended in 24-page booklet. Data is based on actual field experience.—*Oakite Products, Inc., 22 Thames St., New York 6.*

Matting J

Three new catalog sections, Nos. 6100, 6110 and 6120, describe line of matting. Types include corrugated, spike resisting, perforated and sponge-back.—*B. F. Goodrich Co., Akron, Ohio.*

Storage Racks K

Applications and specifications on line of horizontal and skid storage racks are presented in 16-page Bulletin 4873. Included are many "before and after" photos.—*Barrett-Cravens Co., 4613 SW Blvd., Chicago 9.*

Improves Food Processing

BATCH OR CONTINUOUS MIXING

Homogeneous mixing is now obtainable for food products in faster time . . . at less cost . . . with the "ENTOLETER" Mixer. Amazing savings have been effected in processing time. One company has been able to reduce its mixing cycle from 2 hours to ½ hour.

The saving in mixing time is usually accompanied by a smoother, more intimate mix, permitting improvement in product quality. The high-speed centrifugal action thoroughly disperses materials, producing a remarkably smooth textured product.

The "ENTOLETER" Mixer requires only 12 cu. ft., with capacity of 12,000 lbs. of finished mix per hour. This equipment destroys all stages of insect life where beetle or similar insect infestation may be present. Mail coupon today.

ENTOLETER DIVISION
The Safety Car Heating & Lighting Co., Inc.
P.O. Box 904, New Haven 4, Conn.

Please send bulletin describing the "ENTOLETER" High-Speed Mixer

Name

Company

Address

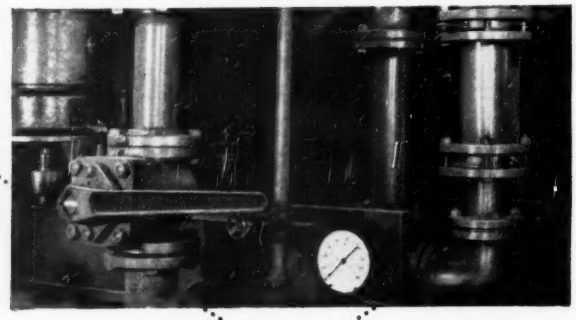
City, Zone and State

Foreign Distributors: Henry Simon Ltd., Stockport, England

SARAN LINED

steel pipe

combines the corrosion resistance of saran with the strength of steel pipe for longer term operation



Put these two advantages of saran lined steel pipe to work for you! Excellent corrosion resistance plus rigidity and pressure strength—advantages that are important in the reduction of shutdowns and lost production. The ease with which saran lined pipe is field fabricated—involving NO costly delays or special tools—makes it well worth investigating.

When planning for use of saran lined pipe, it is advisable to contact Saran Lined Pipe Company for recommendations on your particular problem.

Saran lined steel pipe is available in lengths of 10 feet and in sizes from 1 to 6 inches. Also available are flanges, fittings and valves. Manufactured by The Dow Chemical Company, Bay City, Michigan, distributed by Saran Lined Pipe Company. Dept. TSP-58.

Distributed by

Saran Lined Pipe Company

701 STEPHENSON BUILDING • DETROIT, MICHIGAN

Offices in: New York • Boston • Philadelphia • Pittsburgh
Chicago • Tulsa • Indianapolis • Houston • San Francisco
Los Angeles • Portland • Cleveland • Denver • Seattle
Charleston, S. C. • Toronto

SARAN LINED PIPE
a
DOW
product

Storage Assemblies A

Six-page folder details different rotary storage cabinet assemblies.—*Frick-Gallagher Mfg. Co., 250 S. Broad St., Philadelphia 2.*

Miscellaneous

Basic Canning Foods B

Line of seasonings, special ingredients and flavor products for canners is given in 14-page booklet.—*Basic Food Materials, Inc., Vermilion, Ohio.*

Commodity Handbook C

How to Buy and Sell Commodities, 28 pages, gives a detailed account of the fundamentals in dealing with commodities.—*Merrill Lynch, Pierce, Fenner & Beane, 70 Pine St., New York 5.*

Refrigeration Tips D

Quality control through proper refrigeration is feature of 16-page booklet, *Profit Pointers*. Problems of advertising, bigger payloads and public relations are also discussed.—*Batavia Body Co., Batavia, Ill.*

Stainless Steel Properties E

Concise discussion of properties of stainless steel, and an outline of proper grades to use, feature 12-page booklet *Stainless Steel for Heat Resistance*. Graphs show relative scaling resistance, high temperature tensile strength, creep strength, and high temperature rupture strength.—*Armco Steel Corp., Middletown, Ohio.*

Properties of Thermoplastic F

Physical and mechanical properties of the high polymer "KEL-F" are technically treated in 6-page Bulletin 1-12-49. The thermoplastic is said to be exceptionally stable, non-flammable, and usable at high temperatures.—*Chemical Mfg. Div., The M. W. Kellogg Co., P. O. Box 469, Jersey City 3, N. J.*

Chemicals Catalog G

First catalog of its chemical products listed under company's new name is available. Latest line of products is sold under "Parakeet" brand name.—*Sterwin Chemicals Inc., 170 Varick St., New York 13.*

Handling Phosphoric Acid H

Equipment and procedures for handling 75 percent phosphoric acid in tank car quantities are described in 8-page leaflet.—*Phosphate Div., Montsanto Chemical Co., 1700 S. Second St., St. Louis.*

Can Labeling I

List of can labeling difficulties, with correctives recommended, has been compiled in 24-page booklet.—*National Adhesives, 270 Madison Ave., New York 16.*

Boiler Embrittlement J

Current status of embrittlement in steam boilers, its causes and control, is discussed in 4-page Bulletin 45. How to distinguish between corrosion-fatigue and embrittlement is covered.—*Allis-Chalmers Mfg. Co., Milwaukee.*

Packaging Pointers K

Titled *101 Ways to Better Packaging*, 12-page booklet highlights layout, machine operations and uses of the folding carton.—*W. C. Ritchie & Co., 8805 Baltimore Ave., Chicago 17.* —*End*

no container **BREAKAGE**

and a **BRAKE** *on rising costs with*
REX TABLETOP CHAIN

Rex TableTop Conveyor Chains help keep the brake on production costs 3 ways.

❶ **LESS BREAKAGE AND SPILLAGE.** Smooth, steady travel of **TableTop** means tip-free transfer for your containers, reduces those costly items of bottle and jar breakage, keeps cans and tins "on the right track."

❷ **LONGER CHAIN LIFE.** Simple two-piece construction and unique design make **TableTop** a long-life chain. Wide sprockets engage the entire length of the joint. The pin is relieved of all load while flexing over sprockets. There are no rivets or attachments to work loose. There's no "wobble" possible.

❸ **EASIER TO CLEAN.** There are no pockets to catch and hold dirt on **TableTop.** Smooth surfaces and rounded edges assure a chain that stays far cleaner. Any possible accumulation can be easily removed with a jet of steam or water.

You'll want more information on how **TableTop** *can mean less breakage and spillage . . . lower production costs all along the line. Our new booklet has all the details. Just mail the coupon.*

CHAIN BELT REX COMPANY

DRIVE AND CONVEYOR CHAINS

Chain Belt Company
1616 W. Bruce Street
Milwaukee 4, Wis.

Gentlemen:
Please send me bulletin 50-30.

Name.....

Company.....*Dept*.....

Address.....

City.....*State*.....

m&m's® CANDIES NOW PACKAGED in Riegel's OPAQUE DIAFANE

After extensive sales tests, Riegel's Opaque Diafane-coated wrapper has been selected for M & M's five-cent package. It has exceptional strength, a perfect seal with easy opening, and is moisture-proof to insure freshness. The new package does not slip and slide, stacks neatly on retail counters. Packaging is done on present machinery.

Charles F. White, V.P. in charge of Sales for M & M Ltd., describes the change as "A great new development for the candy trade."

This successful package is just one example of Riegel's ability to produce functional packaging papers, tailor-made for specific requirements. We believe we can offer you a paper that will do as well for you. Just tell us your needs.

RIEGEL PAPER CORPORATION

342 Madison Avenue, New York 17, N. Y.

Patents

Fish Decapitated by Action of Rotary Circular Knife During Passage Along Continuous Conveyor in Manner to Cause Cut Be Made From Belly Side to Back Side of Fish at Angle to Backbone of Each Fish—*Charles M. Savrda, Bay Shore, N. Y., to Fish Machinery Corp., Boston.* No. 2,502,175. Mar. 28, 1950.

Corn and Other Foods Containing 30-65 Percent Discrete Particles and Sauce Containing 80-90 Percent Finely Divided Particles Suspended in Water Sterilized in Container Having Not More Than 35 Percent of Contents in Finely Divided Form With Discrete Particles and Remainder of Finely Divided Particles Substantially Stratified In Layers—*Charles O. Ball, Maumee, Ohio, to The United Products Co., Westminster, Md.* Nos. 2,502,196 and 2,502,197. Mar. 28, 1950.

Produce Washed With Water Containing From 0.0005-0.003 Percent Pyrethrins and Subjected to Vacuum in Range of 1-700 Mm. of Mercury for Removal of Insects—*Charles B. Gnadinger, Edina, Minn., to McLaughlin Gormley King Co., Minneapolis.* No. 2,502,376. Mar. 28, 1950.

Ice Cream Mix Stabilized by Addition of Relatively Small Quantity of Guar Seed Gum—*Sanford J. Werbin to Stein, Hall & Company, New York.* No. 2,502,397. Mar. 28, 1950.

Partially De-Methoxylated Pectin Leached From Vegetable Material With Acid Solution of From 0 to 2.5 pH—*H. S. Owens, Berkeley, Calif., to United States of America.* No. 2,502,477. Apr. 4, 1950.

Glycinin Subjected to Pepsin Under Optimum Hydrogen Ion Concentration and Temperature Conditions for Preparation of Modified Soy Protein—*L. Sair and R. Rathman, Decatur, Ind., to Central Soya Co., Inc., Fort Wayne, Ind.* No. 2,502,482. Apr. 4, 1950.

Grated Coconut Subjected to Vacuum, Treated With Sweetening Composition Under Steam Pressure to Make Sweetened Coconut—*E. F. Glabe to Food Technology, Inc., Chicago.* No. 2,502,516. Apr. 4, 1950.

Foodstuffs Frozen Rapidly By Immersion in Liquid Refrigerant—*A. I. McFarlan, Westfield, N. J.* No. 2,502,527. Apr. 4, 1950.

Normally Soft Unstable Wax Used to Coat Fruit and Vegetables—*S. C. Rieke, Mission, Tex.* No. 2,502,592. Apr. 4, 1950.

Sausage Casings Stuffed By Reciprocal Action of Piston Operating in Horizontal Plane—*A. G. Weier, Chicago.* No. 2,502,611. Apr. 4, 1950.

Eggs Mechanically Cleaned While Held Between Two Rotating Spindles—*L. S. Cranmer and M. Ferreira, Alameda County, Calif.* No. 2,502,616. Apr. 4, 1950.

Bread and Like Contained in Package Consisting of Paper Wrapper and Insert With Parallel Flat Side of Same Cross Section Size As Bread or Cake Loaf Being Wrapped—*W. Swartz, Chicago.* No. 2,502,635. Apr. 4, 1950.

Eggs Mechanically Washed During Passage Through Unit Consisting of Tank Containing Washing Liquid and Endless Scrubber and Drying Belts Operating in Horizontal Plane—*G. W. Johnson, Overland Park, Kan., to Gordon Johnson Co., Kansas City, Mo.* No. 2,502,728. Apr. 4, 1950.

Flour and Like Pneumatically Handled By Aid of Suction Nozzle—*R. A. Norbom, New York City, to National Fitch Corp.* No. 2,502,740. Apr. 4, 1950.

Poultry Dressed in Three Successive Steps of Bleeding, Restricting Trachea, and Passing Through Tank Containing Scalding Liquid—*C. H. Koonz to Swift & Co., Chicago.* No. 2,502,794. Apr. 4, 1950.

Pears Mechanically Positioned and Conveyed Stem End Down—*F. H. Luhdorff, San Jose, and A. R. Thompson, Los Gatos, Calif., to Food Machinery and Chemical Corp.* No. 2,502,797. Apr. 4, 1950.

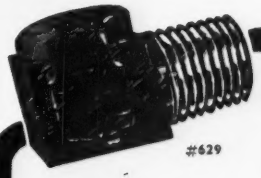
Margarine Packaged With Coloring Injected By Hypodermic Needle Into Interior of Prints In Direct Contact With Margarine But Wholly Concealed—*L. C. Brown to Swift & Co., Chicago.* No. 2,502,920. Apr. 4, 1950.

Corn Syrup Dried to Moisture Content of Less Than 4 Percent By Heated Rolls Operating Under At Least 28½-In. Vacuum.—*W. R. Fetzer to Clinton Industries, Inc., Clinton, Iowa.* No. 2,502,935. Apr. 4, 1950.

Starch Modified to Have As High As 20 Percent Moisture Content By Weight By Action of Aluminum Chloride Hexahydrate—*R. W. Kerr, Riverside, Ill., to Corn Products Refining Co., New York City.* No. 2,503,053. Apr. 4, 1950.

MONOSODIUM GLUTAMATE
Hydrolyzed VEGETABLE Protein
These derivatives of wheat protein are being used by many food manufacturers to
IMPROVE FLAVORS IN FOODS
Write for descriptive literature and samples
THE HURON MILLING COMPANY
9 PARK PLACE NEW YORK CITY 7
In Business Over 70 Years

THERE'S A MONARCH NOZZLE FOR EVERY SPRAY JOB


#629

In many Food Processing plants Monarch Spray Nozzles are used to . . . .

Wax Fruits
Rinse Vegetables
Powder Milk
Dry Eggs
Wash Filter Cake
Humidify
Banana Rooms

Remember

if the liquid can be sprayed with direct pressure Monarch can furnish the Nozzles.

Send for Catalogs 6A and 6C

MONARCH MFG. WKS., INC.
2517 E. Ontario Street
Philadelphia 34, Pa.

There are no "$64" questions when it comes to industrial drying problems. Even in the smallest plants, savings through effective drying run into the thousands of dollars annually. One of the ways that we at STANDARD can take the guesswork out of estimating those savings is through the use of our laboratory test dryer—pictured above. It duplicates the performance under factory conditions of *any* type rotary dryer with *any* desired material. If you have a drying problem, bring it to STANDARD and learn the answer IN ADVANCE.

SEND FOR NEW DRYER BULLETIN

Write TODAY for new 12-page Dryer Bulletin incorporating latest information on STANDARD-HERSEY Continuous and Batch DRYERS and Rotary COOLERS, KILNS, and CALCINERS, for the Process Industries.

STANDARD STEEL CORPORATION

5045 Boyle Avenue, Los Angeles 58, California
Eastern Address: 123—45 Newbury Street, Boston 16

Fats Rendered From Fatty Tissue By Subjection to Propane At 180 Deg. F. For About 5 Hr.—*W. F. Leaders to Swift & Co., Chicago. No. 2,503,205. Apr. 4, 1950.*

Starch Extracted With Solvent For Sterols and Waxes Preparatory to Conversion to Syrups of High Sweetening Power and Low Color—*L. M. Christensen, Lincoln, Nebr., to National Agrol Co., Washington, D. C. No. 2,503,241. Apr. 11, 1950.*

Pectinic Acids Neutralized With Sodium Bicarbonate and Dried to Make Partially Neutralized Low-Methoxyl Pectinic Acid In Granular, Free-Flowing Form—*R. P. Graham, Albany, and A. D. Shepherd, El Cerrito, Calif., to United States of America. No. 2,503,258. Apr. 11, 1950.*

Coherence of Finely Ground Animal Tissue Increased By Inclusion of Not More Than 5 Percent Autolyzed Yeast—*A. L. Lynne, Chicago. No. 2,503,282. Apr. 11, 1950.*

Organic Tissue Simultaneously Desiccated and Defatted—*E. M. Worsham, Monticello, and E. Levin, Champaign, Ill., to E. Levin. No. 2,503,312. Apr. 11, 1950.*

Enzymatic Material Derived From Raw Tissue and Containing Moisture and Fat Simultaneously Desiccated and Defatted—*E. Levin, Champaign, Ill. No. 2,503,313. Apr. 11, 1950.*

Fruits of Different Kinds or Colors Packed in Baskets Partitioned Into Compartments—*O. P. Dowell, Lawrenceville, Ill. No. 2,503,326. Apr. 11, 1950.*

Vegetables Washed in Rotating Drum Substantially Open at Both Ends and Equipped With Longitudinal Baffles and Spray Nozzles—*G. L. McCargar, Detroit, Mich. No. 2,503,556. Apr. 11, 1950.*

Citrus Fruit Treated in Bath Containing Fungicidal Agent and Substituted Ammonium Salt Containing At Least One Hydrocarbon Chain of 10 to 18 Carbon Atoms—*C. E. Gericke, Clewiston, Fla., to American Machinery Corp., Orlando, Fla. No. 2,503,663. Apr. 11, 1950.*

Varietal Color of Citrus Fruit Enhanced By Treatment With Dye Suspended in Solution of Salt of Amine Containing At Least One Hydrocarbon Chain of 10 to 20 Carbon Atoms—*C. E. Gericke, Puerto Castilla, Honduras, to American Machinery Corp., Orlando, Fla. No. 2,503,664. Apr. 11, 1950.*

Varietal Color of Citrus Fruit Heightened by Treatment With Dye Suspended in Solution of Amine at 104 to 124 Deg. F.—*C. E. Gericke, Puerto Castilla, Honduras, to American Machinery Corp., Orlando, Fla. No. 2,503,665. Apr. 11, 1950.*

Cake Decorated and Finished by Mechanical Means—*C. R. Lindquist, Bronx, N. Y., 15 Percent to R. Lindquist and 15 Percent to I. Wamnes, Mount Vernon, N. Y. No. 2,503,673. Apr. 11, 1950.*

Solids in Fruit and Vegetable Juices Concentrated by Periodic Removal of Liquid Content Through Freezing—*R. E. Webb and F. W. Bedford, Dunkirk, N. Y., to Bedford Products, Inc. No. 2,503,695. Apr. 11, 1950.*

Raw Coconut Meats Sliced into Wafer-Like Chips, Pickled in Brine Solution, Dehydrated and Toasted—*T. B. O'Leary to E. T. O'Leary, Miami, Fla. No. 2,503,763. Apr. 11, 1950.*

Impure Sugar-Containing Liquids Freed of Dissolved Pectinous and Albuminous Com-

pounds by Action of Acid-Regenerated Granular Cation Exchange and Alkali-Regenerated Granular Anion Exchange Materials—*F. N. Rawlings, Ogden, Utah, to The Dorr Co., New York City. No. 2,503,767. Apr. 11, 1950.*

Vitamin A Extracted From Cow Livers—*W. Stevens, Weesp, Netherlands, to Hartford National Bank and Trust Co., Hartford, Conn. No. 2,503,853. Apr. 11, 1950.*

Calcium Content of Fluid Milk Reduced to 20 to 70 Percent of Normal and Calcium to Phosphorus Ratio of About 0.15 to 0.75 Obtained by Treatment With Cation Exchange Material Operating in Sodium Cycle and Subsequently Treated With Cation Exchange Material Operating in Hydrogen Cycle to Restore Milk to Original pH Preparatory to Making Stabilized Cream—*L. H. Chrysler and E. F. Almy, Columbus, O., to M & R Dietetic Laboratories, Inc. No. 2,503,866. Apr. 11, 1950.*

Fruits and Vegetables Given Coating of Soft Wax Covered With Shell of Relatively Harder and Normally Stable Wax to Inhibit Mold and Rot Deterioration—*S. C. Ricke, San Juan, Tex. No. 2,503,920. Apr. 11, 1950.*

Candy Coated by Machine Consisting of Inclined Hopper Mounted on Horizontal Axis, Walking Beam Mounted Beneath Hopper and Crank and Pitman Connection to Crosshead to Impart Vertical Movement—*W. F. Murray, Washington, D. C. No. 2,504,037. Apr. 11, 1950.*

Foodstuffs Toasted During Passage on Perforated Endless Conveyor Above and Below Heat-Generating Lamps—*J. G. Davis and C. Jacobson, Portland, Ore. No. 2,504,110. Apr. 18, 1950.*

Noodle Strips Formed, Dried, and Discharged Into Hopper in Continuous Manner—*J. L. Mariani, New York City. No. 2,504,339. Apr. 18, 1950.*

Nuts Mechanically Cracked During Passage Through Continuous Operating Unit—*F. M. Baldwin, San Francisco, Calif. No. 2,504,374. Apr. 18, 1950.*

Doughs Made in Mixer Equipped With Refrigerated Walls—*M. A. Stiefelber, Kansas City, Mo., to Stickelber & Sons, Inc. No. 2,504,465. Apr. 18, 1950.*

Fat Rendered From Fatty Animal Tissue and Aerated With Combustion Gases Consisting of Carbon Dioxide, Acetylene, Oxygen, Carbon Monoxide, Methane, and Nitrogen—*M. E. Dunkley, Modesto, Calif. No. 2,504,507. Apr. 18, 1950.*

Fondants, Fudges and Like Made by Heating Chip Sugar at Not to Exceed 165 Deg. F. and Mixing With Separately Prepared Water Solution of at Least Sucrose, Corn Sugar, and Corn Syrup, Followed by Cooling and Creaming of Mixture—*H. Lebeson and A. H. Field to National Syrup Products Co., Chicago. No. 2,504,542. Apr. 18, 1950.*

Nut Butters Stabilized by Incorporation of Hydrogenized Oil Stabilizer Containing Edible Oil Hydrogenated Only to Point of Maximum Trans 9, 10 Octadecenoic Formation—*F. L. Avera to Rosefield Packing Co., Ltd., Alameda, Calif. No. 2,504,620. Apr. 18, 1950.*

Milk and Milk Products Emulsified During Radial Passage Under Pressure Through Assembly of Disks and Plurality of Fine Screens—*J. H. Gardner, Daytona Beach, Fla., to E. Gardner. No. 2,504,678. Apr. 18, 1950.*

—End

ah! what delicious flavor

You'll agree, your customers will agree, it's the FLAVOR that makes the meal.

D&O has the Perfect Flavor and the correct flavoring materials to serve your every specific flavor requirement starting from shrimp cocktail sauce, to soup, to gravy... including powdered dessert and cake frosting.

SPICEOLATES,

the water-soluble spice flavors made by D&O from pure natural oils and oleo resins offer greater economy and completely uniform flavor quality. Spiceolates are pure products in every respect.

Additional information concerning the use of Spiceolates on request.

For better flavors . . . consult D&O.

D&O

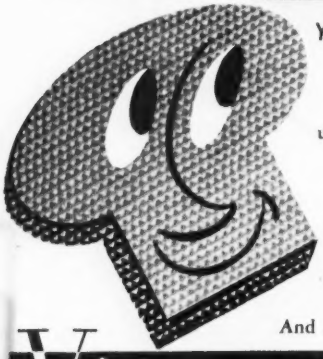
DODGE & OLCOTT, INC.

180 Varick Street • New York 14, N. Y.

ATLANTA • BOSTON • CHICAGO • CINCINNATI • DALLAS
LOS ANGELES • PHILADELPHIA • ST. LOUIS • SAN FRANCISCO

ESSENTIAL OILS • AROMATIC CHEMICALS
PERFUME BASES • VANILLA • FLAVOR BASES

for
TROUBLE-FREE
SERVICE



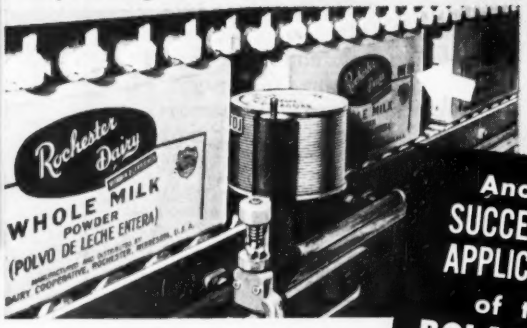
You Can't Beat **VICTOR 475**
Food Conveyor Belting

Victor 475 is built right to stand up under the heaviest demands of the food processing industry. Composed of solid woven cotton belting thoroughly impregnated with Neoprene, it can withstand the action of vegetable, mineral, and fruit acids and oils. It's odorless . . . tasteless . . . can't pick up small particles. And . . . it's economical. You'll want to look into the advantages of Victor 475. It's fast relief for operation and production headaches. Send for Bulletin #18.

Victor
Batata & Textile Belting Co.
33 Park Pl., N.Y. 7 • 300-6 W. Hubbard St., Chicago 10
Factory: Easton, Pa.

6641

Imprinting LOT NUMBERS on SHIPPING CASES



Another SUCCESSFUL APPLICATION of the ROLACODER* Marking Machine #6 IN A SERIES

At Rochester Dairy Cooperative this ROLACODER Marking Machine works 'round the clock . . . on each of three shifts saves one man's time. The ROLACODER not only replaces rubberstamping and stencilling manual labor . . . but makes neater, cleaner, surer imprints of lot numbers, codes, brand names, etc. Works automatically on sealers, conveyors, other packaging machines. Uses quickly interchangeable rubber type or special dies. Models to imprint small or large legends on all kinds of packages.

Write for DATA SHEET 6.0

*Pat. Pending

MARK O MATIC
ADOLPH GOTTSCHO, INC.
MACHINES TO MARK, WHATEVER YOU MAKE
TERMINAL RD., HILLSIDE 5, N. J.

Truck Speeds

—*Continued from page 77*

unit are mounted side by side on the same brackets, with the condensing unit on the outside. But each unit is independently removable for ease of repair or adjustment.

To obtain maximum connecting-hose life and to reduce the chance for line failures, the hydraulic system has been designed to operate at pressures not over 800 lb. per sq. in. In the condensing unit the refrigerant used is Freon F 12.

To obtain spare parts readily and quickly, all of the system's components are of standard manufacture. The entire hydraulic system is made by Vickers, Inc.; the compressor body by General Electric; the vacuum cylinders by Bendix Products Corp.; the solenoid valves by the Aleo Valve Co.; and the electric motor by the Wagner Electric Co. These concerns maintain adequate service and parts stores in nearly every large center of population.

Inasmuch as the hydraulic system is self-lubricating and is operated in a semi-sealed condition, there is little likelihood of failure, except through line breakage or through foreign matter in the oil. Line breakage has been minimized through use of top quality connections and reduction of operating pressures (limit set at 800 lb. per sq. in.).

—*End*—

What the Military Wants

—*Continued from page 48*

legal as well as production and scientific aspects. Legally, the addition of any material to milk has been taboo for a number of years. During World War II, the Food & Drug Administration was not asked to rule on the addition of antioxidants to dry whole milk or ice cream mixes. The general attitude of F&DA was taken into consideration in setting up studies on antioxidants whose toxicity had not been established. Today, a number of antioxidants have been approved for use in lard and shortening products.

Antioxidants for fat, which will extend the storage life of food products containing fat as an ingredient, are particularly interesting to the Armed Forces.

Available antioxidants are effective in prolonging the storage life of fats, but the effect of the antioxidants is generally lost or seriously reduced when the fat is introduced into other

food products, such as biscuits. Required is more specific information leading to the selection of antioxidants to effectively extend storage life of these fat-containing food.

At present, this project is largely a screening operation for various available antioxidants. During the recent war, a number of antioxidants were investigated, and a few of them appeared to be beneficial insofar as protection of milk, animal, and vegetable fats are concerned. Since the war, other antioxidants have become available, and additional screening work is being done on these to determine whether they have the required inhibiting characteristics and non-toxicity.

Use of Frozen Milk

A knowledge of the degree of preservation to be obtained by freezing milk is of value to the Armed Forces, since frozen milk appears to be a logical form of supply for installations having adequate handling facilities and requiring only limited quantities of the product. The problem in this instance is to provide frozen milk that will not separate when transported through the supply lines or stored at 20 deg. F. This is another project that will require the aid and counsel of interested members of the industry for its best solution.

—End—

What Do Consumers Say?

—Continued from page 39

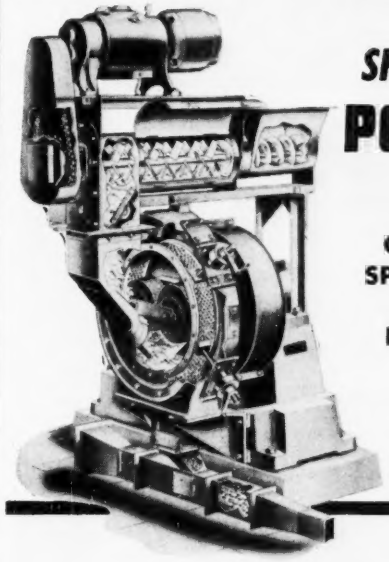
One-half of each sample is forwarded to our coffee procurement offices blind coded, except that the samples are identified as to the group to which they belong. There they are also cupped by a panel of five tasters, and the results are returned to us to be de-coded and compiled.

These results are consolidated into a single quality index, as follows: Each first choice is given a weight of 1 point, each second choice a weight of 2 points, and so on down to the last or sixth choice, assigned 6 points. The decisions from each taster enter into the total so that the theoretical first choice would be 6 and the theoretical last choice 30. And to procurement and production there goes each week a report showing the relative standings of our three coffees in respective comparison with the competitive coffees.

At the same time, the point values for each coffee furnish an estimate of how great the differences are. These weekly quality indices are plotted for each coffee (our own as well as competition), each group on a page of its own. Also histograms for each four-week period are prepared on one page.

PELLET YOUR PRODUCTS

PROMOTE YOUR PROFITS



with

SPROUT-WALDRON

PELLET MILLS

for

DOG FOOD
CEREAL PRODUCTS
SPECIALTY PRODUCTS
ANIMAL FEEDS
RODENT POISONS
etc., etc.

The modern trend to pelleting is making great strides in the food and allied industries. Day after day, Sprout-Waldron's engineers are called upon to make recommendations on pelleting a great variety of products.

Pelleted products are easier to handle, easier to merchandise, easier to sell. They have less competition, bring a higher price – step up profits.

Pioneers in pelleting, Sprout-Waldron have the experience, know-how, and facilities to supply you with the finest pelleting equipment, engineered to your individual needs.

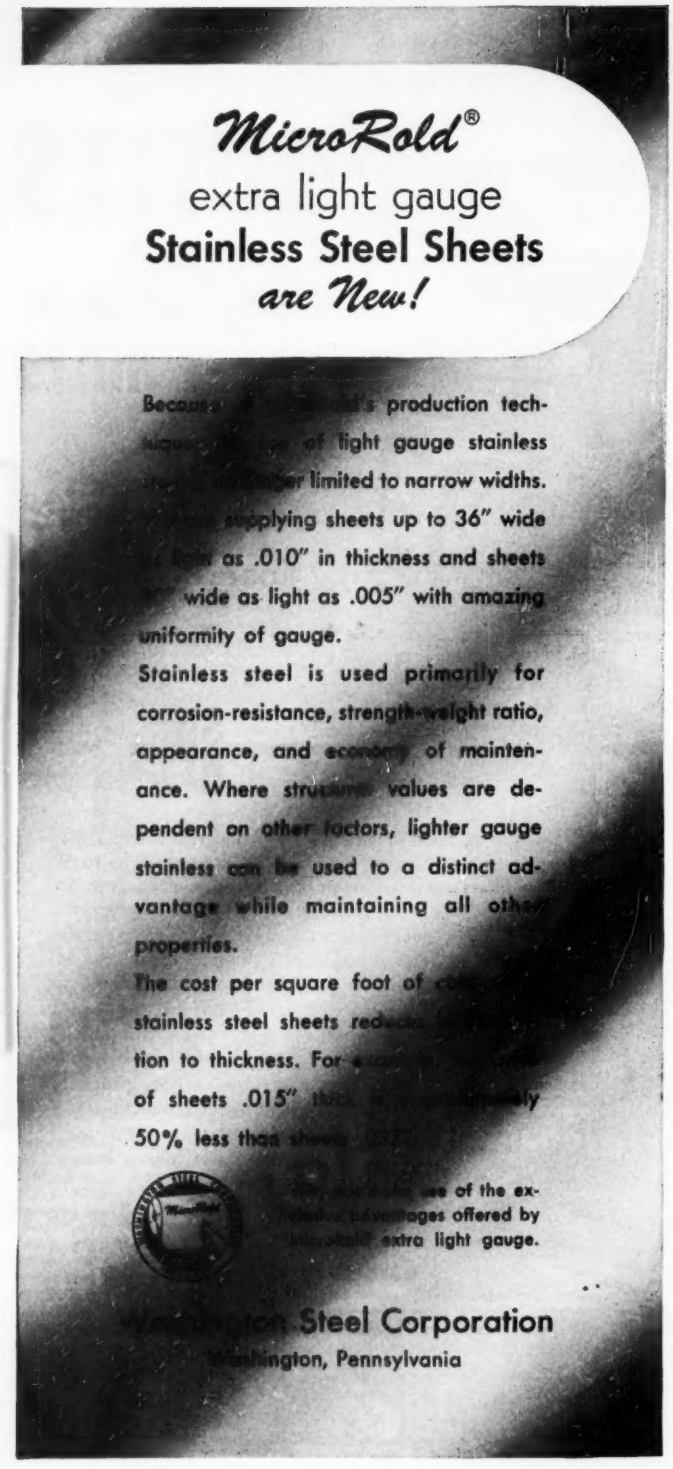
Arrange now to consult Sprout-Waldron on your pelleting problems. Write today for New Simplex Bulletin 10-C.

Sprout, Waldron & Co., Inc.,
35 Waldron Street, Muncy, Penna.

153

LOOK TO SPROUT-WALDRON for BETTER PROCESSING EQUIPMENT

Sprout-Waldron
Manufacturing Engineers
SINCE 1846
MUNCY • PENNSYLVANIA


MicroRold®
extra light gauge
Stainless Steel Sheets
are New!
production tech-
of light gauge stainless
limited to narrow widths.
supplying sheets up to 36" wide
as .010" in thickness and sheets
wide as light as .005" with amazing
uniformity of gauge.
Stainless steel is used primarily for
corrosion-resistance, strength-weight ratio,
appearance, and economy of maintenance. Where structural values are dependent on other factors, lighter gauge
stainless can be used to a distinct advantage while maintaining all other
properties.
The cost per square foot of
stainless steel sheets red
tion to thickness. For
of sheets .015"
50% less than
of the ex-
ages offered by
extra light gauge.
Steel Corporation
Washington, Pennsylvania

These show, by groups, the relative quality of the coffees for that period.

At the conclusion of each four-week period, these two reports are submitted to merchandising, production management, production, and procurement so that the quality position of our coffee, for the period just ended, may be rated at a glance. Moreover, the graph reflects the cumulative trend to date and furnishes, as well, some idea as to uniformity or lack of uniformity in the coffees.

Juices Checked

Our line of canned citrus juices have met with very favorable acceptance, and we think our efforts to keep them attuned to the consumer's palate have contributed not a little. Our current standards, covering the gross aspects of flavor, have been arrived at by this procedure:

Because of insurmountable difficulties in handling a problem of this nature with a group like the Homemakers Reference Committee, we drew on the personnel of our staff. First, we assembled supplies of good quality canned, sweetened grapefruit juice having an acid content of 1 percent in terms of citric acid and covering a range of Brix values from 12 deg. through 16.5 deg. in increments of 0.5 deg. To aliquots of each Brix level were added increments of citric acid covering various ranges.

These samples, on a blind basis, were submitted singly to the panel, consisting of 25 tasters. They were asked to taste the sample submitted and to indicate whether it was good or was not good, and to tell why. We arbitrarily adopted the criterion that to be acceptable a sample must be considered good by 75 percent of the panel.

By these means we found that canned, sweetened grapefruit juice with an acid content greater than 1.6 percent is considered tart—hence not desirable—regardless of the sugar added. Also, that the consumer regarded a sugar content corresponding to more than 14.5 deg. Brix as undesirably sweet even though acid is less than 1 percent.

Just last year, the Production & Marketing Administration of the USDA issued revised standards for canned, sweetened grapefruit juice (effective July 29, 1949). It was interesting to note that with respect to acid and sugar levels and acid-sugar ratios there is much in common with the results we obtained. Our standards, however, lie within the limits established by the Production & Marketing Administration, because we are in a position to be somewhat more selective in setting up our specifications.

By the same process, we arrived at

standards for canned, sweetened blended citrus juice. In this instance, it was found that the juice was considered too tart if its acid content exceeded 1.5 percent, despite the amount of sugar added. Again, sugar added in excess of 15 deg. Brix made the juice undesirably sweet even though acid did not exceed 1.5 percent.

We also have projected such work for canned, unsweetened orange juice. By means of it we hope to obtain confirmation of, or guidance for, revising the ideas we entertain now, which are:—

Brix	Acid Range
11.5 (Minimum)	1.14 (Maximum)

Through the utilization of acceptability technics, we have learned that tomato juice should be salted in the range of 0.80—0.90 deg., and that acidity should not exceed 0.6 percent acid as citric.

Also, we have done much work with canned apple sauce and have come to the conclusion that its soluble solids content, as determined by refractometer, should not be less than 19 percent and should not exceed 21 percent for general consumer acceptance.

—End—

Modernizes Management

—Continued from page 75

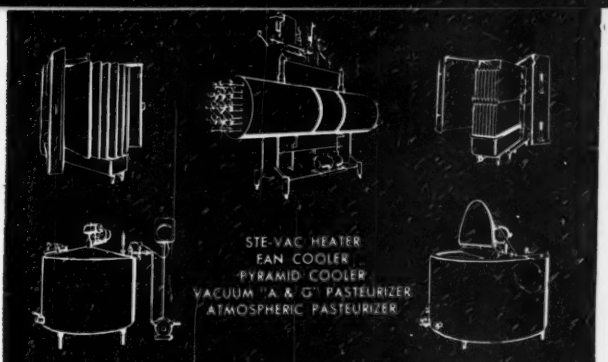
space. This is a double-deck conveyor which efficiently carries full boxes to the trucks backed up to it, as well as empty boxes from the trucks to the plant.

Automatic Control Devices

In any automatic food production line, high efficieney involves not only modern equipment, but also devices that keep the processing and conveying lines running continuously with little help from operators. And these, of course, must be supplemented by process-variable controls and adjustments.

The long traveling ovens in the Fuehs bakery are equipped with variable-speed drive, an electric tachometer which registers speed on a meter, and "slow" and "fast" pushbuttons for speed regulation. The Reeves variable-speed adjusting unit is equipped with a reversing motor to make the "slow" and "fast" pushbutton operation feasible. This motor changes the distance between the conical shaped pulley halves to speed or slow the oven, depending upon which button is pushed. The operator simply holds the button down until the electric tachometer registers the oven speed which he desires.

The oven is also equipped with auto-



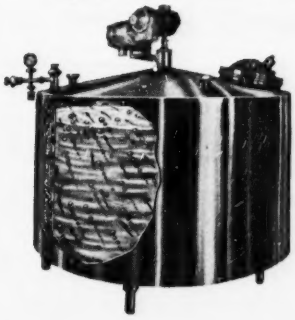
COMPLETELY SANITARY
VACUUM PROCESS VATS
for HEATING • COOKING • COOLING
... UNDER VACUUM

The Chester-Jensen
Vacuum Batch Pasteurizer

★ Off-flavors, volatile odors, and air are removed while heating, holding and cooking.

★ Heating or cooling water circulates at high velocity thru the spiral water jacket producing heat transfer throughout the entire side wall and bottom area.

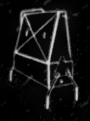
★ Correct agitation to insure complete mixing at low speed.

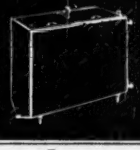


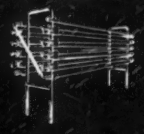
Full specifications and bulletins gladly furnished on request.

Chester-Jensen Vacuum Batch Pasteurizer

44


BEVERAGE COOLERS


INDUSTRIAL CHILLED WATER UNITS


INTERNAL TUBE HEATER COOLERS

Chester-Jensen Company
5th AND TILGHMAN STS. CHESTER, PENNSYLVANIA

DEALER COOLERS

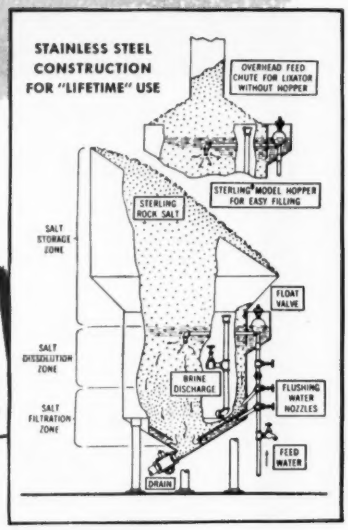
SUPER DEODORIZER

BRINE! EXACTLY RIGHT WITHOUT MEASURING or STIRRING

JUST TURN IT ON!

STERLING ROCK SALT
BRINE DELIVERED BY PIPE TO EVERY POINT IN YOUR PLANT

• FLAVORING • WASHING • SOAKING
• BLANCHING • GRADING • BRINE PEELING
• ZEOLITE WATER SOFTENERS • PICKLING



HOW LIXATOR WORKS

In the dissolution zone—flowing through a bed of Sterling Rock Salt which is continuously replenished by gravity feed, water dissolves salt to form 100% saturated brine. **In the filtration zone**—through use of the **self-filtration** principle **originated by International,** the saturated brine is thoroughly filtered through a bed of undissolved rock salt. The rock salt itself filters the brine. Nothing else is needed.

WHAT THE LIXATOR PROVIDES

- ✓ **Chemical and bacterial purity to meet the most exacting standards for brine.**
- ✓ **Unvarying salt content of 2.65 pounds per gallon of brine.**
- ✓ **Crystal-clear brine.**
- ✓ **Continuous supply of brine.**
- ✓ **Automatic salt and water feed to Lixator.**
- ✓ **Inexpensive, rapid distribution of brine to points of use by pump and piping.**

Savings up to 20% and often more in the cost and handling of salt have been reported by many Lixate users. Why not investigate?

• Say good-by to "guesswork" and bother! You can eliminate shoveling, hauling, and laborious hand stirring of salt and water—with International's Lixate Process for Making Brine. Assures accurate salt measurement every time. Stops waste through spilling. Saves time and labor.

• The Lixator *automatically* produces 100% saturated, free-flowing, crystal-clear brine which may be piped to as many points in your plant as you wish—any distance away—by gravity or pump. YOU SIMPLY TURN A VALVE to get self-filtered LIXATE Brine that meets the most exacting chemical and bacterial standards.

An INTERNATIONAL Exclusive

The LIXATE* Process

FOR MAKING BRINE

*REG. U. S. PAT. OFF.

INTERNATIONAL SALT COMPANY, INC., Scranton, Pa.

matic temperature control in each of the four oven zones. These operate at 510, 505, 490 and 470 deg. F., respectively, from entrance to discharge end.

Automatic devices also are used in the dough mixing operation. Water is metered by a pre-set flowmeter with automatic cut-off, the mixer temperature is controlled, and a timer shuts the mixer off after a pre-set period has elapsed. The hoists which lift dough troughs over the mixers have electric contacts to automatically stop the motor driving the screws.

The empty pan conveyor is equipped with a transfer to feed the two molders-panners from the pan line, electric contacts controlling this conveying and transfer operation.

Electric contacts also operate the pusher bar on the proofer loader, actuating this bar after six pans are lined up and ready to be shoved onto the proofer shelf by a hydraulically operated pusher bar.

A pusher bar also shoves pans into the oven, and electric contacts prevent its operation if the oven is full. These contacts also stop the proofer until the oven is ready to take additional rows of pans.

Another automatic control device prevents the depanning bar from tripping until bread is clear on the cooler conveyor. Then the conveyor to the cooler stops automatically while the pusher bar shoves the loaves onto the shelves of the cooler, which has a capacity of 8,600 loaves per hour.

When there is a shortage of pans at the molder-panner, a bell rings automatically to notify the operators. An air-operated dumper drops molded dough into the pans. As the dough comes from the molder, it goes over a trip that actuates an electric relay controlling the air valve which moves the pans into place. There also is a no-pan control to avoid dropping of dough when there is no pan to catch it.

The proofer is arranged to feed either one or two of the molders at once. By means of a manual setting, the proofer can be made to drop the dough onto either or both of two belt conveyors which feed the molder-panners.

In addition to automatic controls, instruments are used to record important process variables, the recorder charts serving as a check both on quality and on the performance of workmen in charge of the operations. Located in the superintendent's office, the instruments record the temperature of the mixers, ovens, and refrigerated water used in ingredient make-up. They also record the temperature and relative humidity of the fermentation room and of the bread cooler and final proofer, as well as oven speed. The

instrument panel also includes indicating gages for steam, water and air pressure.

Drives Sanitation Home

Fuchs has employed a device which proves extremely effective in getting employees to meet plant sanitation regulations. After warning offenders, the sanitarian takes pictures of improper conditions which have not been corrected. These photos are sent, with a report, to the department foreman.

The sanitarian also uses another effective device. When a bad sanitary condition or practice is found, he has a cartoon drawn to illustrate the fault, and puts the cartoon on the wall right where the trouble occurred.

Picture Credit—Some of the photographs used in this article were supplied by Baker, Perkins, Inc.

Editor's Note—Innovations involved in the production of sweet rolls, together with an effective new pan glazing operation, will be described in a later issue.

—End—

FCC Evaporator

—Continued from page 56

amount necessary to produce 28 gal. concentrate) could be carried out in a 2-stage unit, each stage being composed of a vapor separation chamber, a tube-nest heater, and recirculating pump. Vapor removal and heating could be provided by a thermocompressor removing the vapor simultaneously from both separation chambers and discharging into each of the two falling film juice heaters, with excess vapor taken out by the barometric booster.

As stated, design of the first and second stage-vapor separation chambers was simplified by using a tangential opening into the separator to allow the partially concentrated juice to follow the sides in a thin film. To facilitate building, both separators were made the same size.

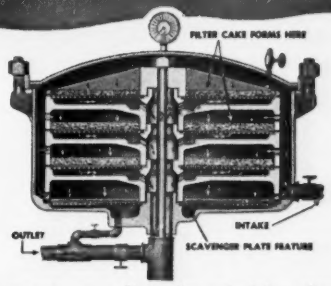
Chambers of 24 in. dia. were used, and the upward vapor speed in these is 27 ft./sec., with considerably less velocity across the tangential section. The vapor chambers were built about 5½ ft. in height, providing ample separation space.

Collector chambers, equipped with sight glasses, are attached to the bottom of the vapor separators to maintain a constant head of juice on the recirculation pumps. A cross is mounted in the collector chamber to stop the centrifugal force of the juice before it enters the suction pipe lead-

FOR HIGH SPEED, UNIFORM FILTRATION REQUIRED IN FOOD PROCESSING

SPARKLER horizontal plate FILTERS

Capacities 50 G.P.H. to 5000 G.P.H.



HERE ARE A FEW FOOD PRODUCTS THAT SPARKLER FILTERS HANDLE WITH EASE:
Candy Scrap
Chicken Broth
Cider
Egg Albumen
Extracts
Flavors
Honey
Gums
Liquors
Milk
Molasses
Vegetable Oil
Syrups
Vinegars
Wines
Fruit Juices
Alcohols
Alkalies
Beverages

Sparkler Filters operate on a distinctive principle, using horizontal plates, that are particularly efficient in maintaining uniformity in operation over a wide range of pressure, temperature, or viscosity conditions.

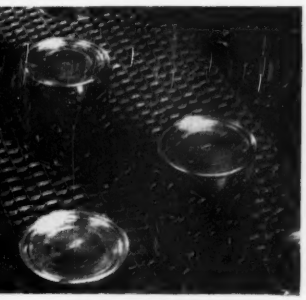
Filters water sparkling clear, removes all off-tastes, odors, color, sediment, chlorine, sulphur, algae, pipe rust, etc.

Because filter media are supported on a horizontal plane and filter aids floated into position uniformly, filtration takes place uniformly over entire filtering areas. Flow through filter is always with gravity. The patented scavenger plate filters the last drop, leaving no hold over in batch filtration.

We invite correspondence on your problems. You will receive the advice of filtration engineers with over a quarter of a century experience in a specific field.

SPARKLER MANUFACTURING COMPANY
MUNDELEIN, ILLINOIS

Fills EVERY Food Conveying Need At Surprisingly LOW COST



● LA PORTE
FLEXIBLE STEEL CONVEYOR BELTING

Whether your process is Freezing, Canning, Pickling, or Dehydrating, a La Porte Belt will carry your product through every operation, plus packaging and crating safely, quickly and economically. Its strong steel mesh construction resists loading impacts, prevents creeping, weaving, and jumping, and permits the circulation of air, and liquids around products in process . . . also facilitates cleaning and sterilizing.

Ask your Supplier TODAY for La Porte Conveyor Belting. It is available in any length—almost any width.

LA PORTE MAT & MFG. CO.
BOX 124 LA PORTE, INDIANA

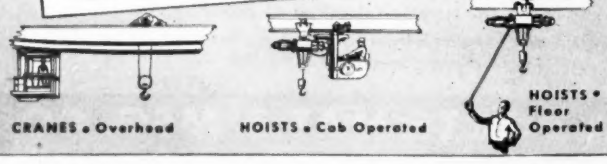
Cab-operated electric hoist operating in conjunction with a single beam crane picks up the load *at the door*—delivers it directly to storage area. No re-handling. No aisle space or turning radii needed. Minimum head room required. Every cubic foot of space is put to work.

This is but one example of many applications designed by Shepard Niles specialists to reduce handling costs. Your problem may be different, but you can be sure you'll get the right answers from Shepard Niles—America's largest manufacturer of load-lifting and load-moving equipment. Write for Bulletin 130 today.

Shepard Niles

CRANE & HOIST CORPORATION

Makes and sells all three lifting tools for airborne shop loads



CRANES • Overhead

HOISTS • Cab Operated

HOISTS • Floor Operated

422 SCHUYLER AVENUE • MONTOUR FALLS, N. Y.

ing to the recirculation pump. To prevent water from draining from the booster suction into the vapor chamber, a small baffle is placed in the bottom of the vapor ducts.

Sufficient heat must be furnished the juice during recirculation through both stages to evaporate 700 lb./hr. water vapor. This heat is furnished by vapor removed from the pan by the thermocompressor, to which a supply of motive steam is added to increase the temperature of the pan vapor that facilitates heat exchange and assists in maintaining the vacuum. The total steam required to remove 700 lb. vapor at 70 F. is 803 lb./hr., or a steam-to-vapor ratio of 1.15. Larger units are designed with a 0.95 ratio. The thermocompressor has an 8-in. suction, 6-in. discharge, is mounted between stages, and discharges into the top of both heaters.

Falling Film Juice Heater

The juice heaters are composed of 20 1½-in. tubes 10 ft. long and spaced on 2¼-in. centers. Each tube has a distributor inserted in the top that forces the incoming juice to follow the wall of the tube and minimizes the quantity falling through the center.

A condensate line joined to the bottom of each heater conducts the vapor condensed therein to a condensate pump. This insures instant removal of water from the heaters. Vapor in excess of that needed for heating is condensed in the barometric unit.

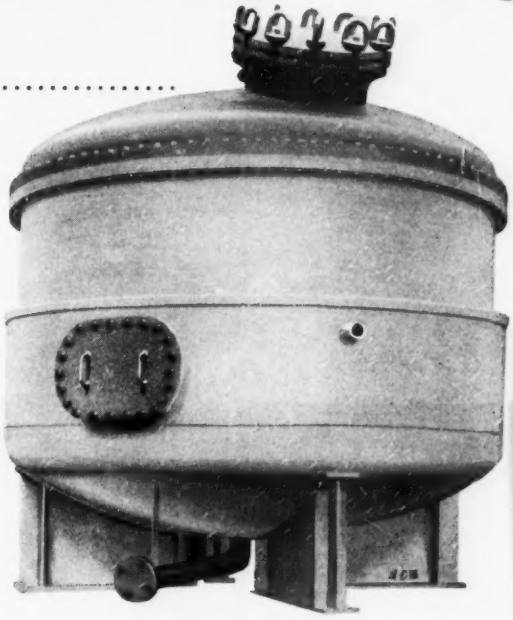
In each stage, 40 gpm. of juice is circulated through each heater. Pumps used are designed with a low net positive suction head to prevent cavitation of the juice. Suction inlets are 3 in. on the low Brix stage and 4 in. on the high Brix stage.

In starting operations, the air ejectors are turned on, and as soon as a vacuum of 28 in. is obtained, water is permitted to enter the barometric condenser. Juice is pumped into the first stage and flows to an equal height in the second stage. Circulating pumps, barometric booster, and thermocompressor are then turned on.

As the juice begins to drop, more is supplied to maintain a constant level. Concentration is continued until 25 Brix is obtained in the first stage and 55 Brix in the second. Thereafter, juice is fed to the first stage in proportion to the quantity of concentrate removed from the second stage.

Acknowledgement: The authors wish to thank W. Fred Schopke, Jr., and F. L. Ike Osborn for assistance in planning the layout and constructing this evaporator, also, Courtney A. Forth and other members of the engineering staff of Ingersoll-Rand Co. for design of suitable boosters and pumps.

How to Make Gelatin Extraction as Easy as its Eating



PROJECT: *To obtain maximum yield of high-purity gelatin with maximum economy in batch extraction process involving a pH acid condition. Discoloration and off-flavor from hot spots must be prevented.*

DESIGN: *Jacketed steam-heated tanks with smooth flowing, curved contours and flued openings. Inner tank shell of Lukens Nickel-Clad Steel; outer tank shell of carbon steel. Circulation of steam provided for by passage between shells. Rapid heatup and shutdown and uniformity of heat dispersion assured by nickel-clad steel walls. Resistance to acid attack and ease of cleaning with strong cleansers provided by smooth, curved, unobstructed nickel interiors of inner tank; strength and rigidity by its steel backing.*

END RESULT: *Increased batch production of high-purity, flavor- and color-true gelatin with minimum operating and maintenance costs.*

Here is another example of how the coordinated ingenuity of designer, engineer, fabricator and materials supplier resulted in the efficient, economical answer to an equipment problem. This was the result of applied *Lukenomics*. For Lukenomics combines the experience of equipment designers and builders with Lukens' knowledge gained over 140 years as the world's leading producer of specialty steel plates, heads and steel plate shapes.

It's sound judgment to put Lukenomics to work on your equipment problems. There are progressive fabricators who can do this for you. Get in touch with them, or write our Manager of Marketing Service, stating your problem. Lukens Steel Company, 401 Lukens Building, Coatesville, Pennsylvania.

Artisan Metal Products designed and fabricated the above tanks for a large meat packer, using plates and heads of Lukens Nickel-Clad Steel.

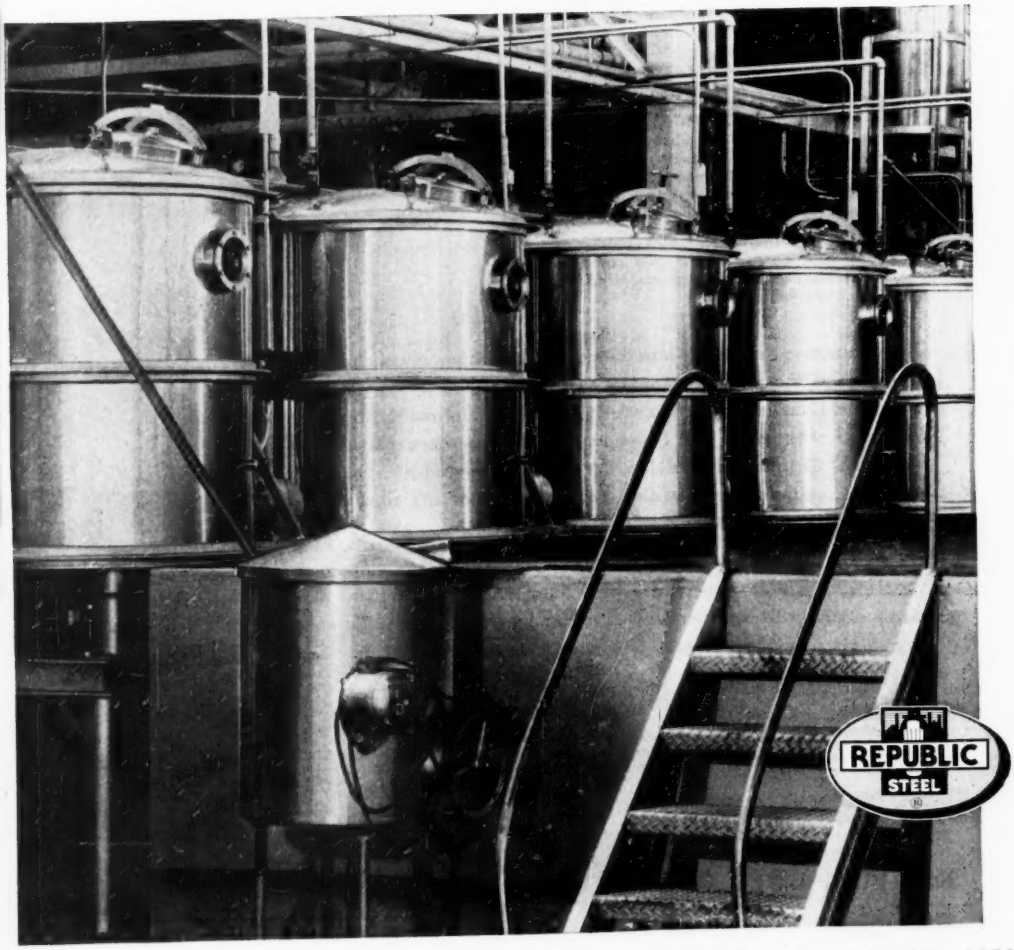
LUKENS

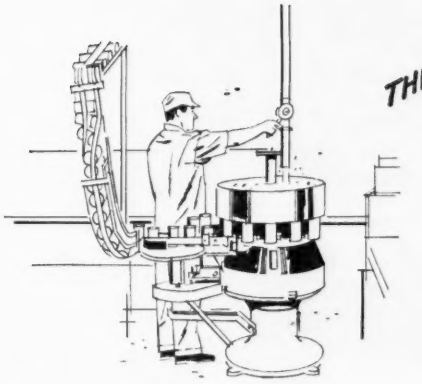
LUKENS STEEL COMPANY

BETTER PRODUCTS FOR BETTER EQUIPMENT

Enduro®

STAINLESS STEEL





THRIFTY METAL OF 10,000 USES

Thrifty ENDURO saves pennies, dimes and dollars by standing guard over the purity of food in process. That's why all-ENDURO equipment is a major step toward quality control—in fruit juice tanks like those on the page opposite, tomato juice filling machines as sketched at the left, conveyors, cookers, filters, kettles, pans, freezing and packaging equipment—everywhere food-in process touches. There are PROFITS in quality control!

...FOR A BLEND THAT SATISFIES

A blend that satisfies *all three* . . . you, the processor—Jones, the retailer—and Mrs. John Consumer. Its quality must be consistent—its color right—its flavor taste-teasing! If not—there'll be competing goods clamoring for its shelf-space in food stores everywhere.

A prominent tomato juice packer states his reason for turning to stainless steel for processing—"because stainless steel resists the corrosive effects of the fruit acids, will not blacken, will not impart a foreign taste to the tomatoes."

Here stainless steel is used as a dependable means of quality control . . . and therefore of maintaining worthwhile profits. ENDURO is rust- and corrosion-resistant. Being chemically inert it never affects, nor in any way alters, the food in process. Its smooth, pore-free surface is sanitary-as-glass and as easily cleaned. Without pores to serve as foothold for carryover, it comes *clean* without taint or contaminant remaining to affect the next batch.

ENDURO is high in strength—has a ruggedness that laughs off maintenance and pays little attention to the production years that roll by. It will be just as good many years from now as it is today!

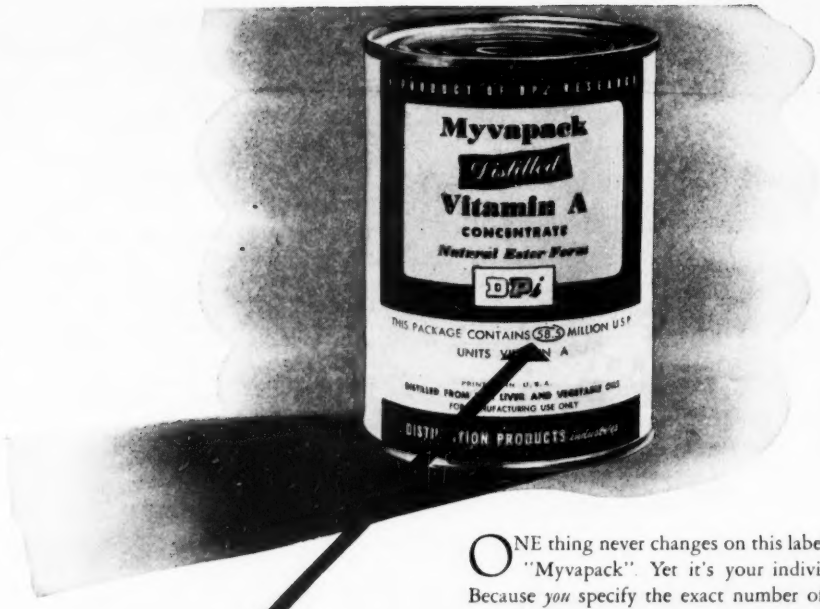
Figured by quality control, by surprisingly low maintenance, by unbelievably long life . . . it's one of the smartest investments you can make. Slightly higher initial cost? Possibly! But how quickly this differential is wiped out! Let us tell you more!

✓ **CHECK ALL 10 ADVANTAGES:** Rust- and Corrosion-Resistance • Heat-Resistance • High Strength • No Metallic Contamination • Sanitary Surfaces • Easy to Clean • Eye Appeal • Easy to Fabricate • Long Life • Low End Cost • *What more can be desired in a material?*

For Complete Details Write

REPUBLIC STEEL CORPORATION

Alloy Steel Division, Massillon, Ohio • **GENERAL OFFICES, CLEVELAND 1, OHIO** • *Export Dept.: Chrysler Bldg., New York, 17, N.Y.*



the can with a thousand labels

ONE thing never changes on this label—the trade-mark "Myvapack". Yet it's your individual label. Why? Because *you* specify the exact number of vitamin A units for a batch of your product—and this figure is printed right on the label for fool-proof identification.

"Myvapack" signifies DPi's sealed can of the finest natural vitamin A concentrate you can use for food fortification, premeasured to any total potency from 20 to 200 million U.S.P. XIV units. It's the same type and quality you can also get in containers ranging from small bottles to 55-gallon drums.

Rigid quality controls at DPi's great new plant for continuous, large-scale molecular distillation make it unexcelled among natural materials for blandness, stability, and biological effectiveness.

DPi Distilled Vitamin A Esters are now available for prompt shipment at current competitive market prices. For further information and quotations write ***Distillation Products Industries,*** 723 Ridge Road West, Rochester 3, N.Y. (Division of Eastman Kodak Company). Sales Offices: 570 Lexington Avenue, New York 22, N. Y. • 135 South LaSalle Street, Chicago 3, Ill. • Gillies & Loughlin, Los Angeles and San Francisco • Charles Albert Smith, Ltd., Montreal and Toronto.

DPi

leaders in research and production of both natural and synthetic vitamin A

Also... high vacuum equipment... distilled monoglycerides... more than 3300 Eastman Organic Chemicals for science and industry

NEW Internationals with *Metro bodies–

and look what's in them for a grocer

New lower Metro floor height for faster, easier loading and unloading.

New wider front-door openings for easier handling of big packages.

New rear doors of different sizes and types to meet every need.

New smart styling that makes the Metro an advertisement on wheels.

New larger windshield, quarter and door windows for safer visibility in every direction.

New wider-tread front axle that permits 37° right and left turns—the shortest practical turns you can make.

New Silver Diamond valve-in-head engine carefully matched to your power needs for maximum economy.

New Synchro-shift transmission specially designed for extra-long life in multi-stop service.

New hypoid-gear rear axle, new springs, new frame, new features from bumper to bumper.

New range of Metro body and International chassis sizes to meet every requirement: GVW ratings from 5,400 to 10,000 pounds; body capacities from 235 to 375 cubic feet.

PLUS . . . Heavy-duty engineered stamina in every *light-duty* Metro. This gives you the long life and economy that has kept Internationals first in heavy-duty truck sales for 18 straight years.

Conclusion: You'll be money ahead to get all the facts from your nearest International Truck Dealer or Branch. Do this now.

*Metro. Registered trade mark of The Metropolitan Body Company, Inc., subsidiary of the International Harvester Company.

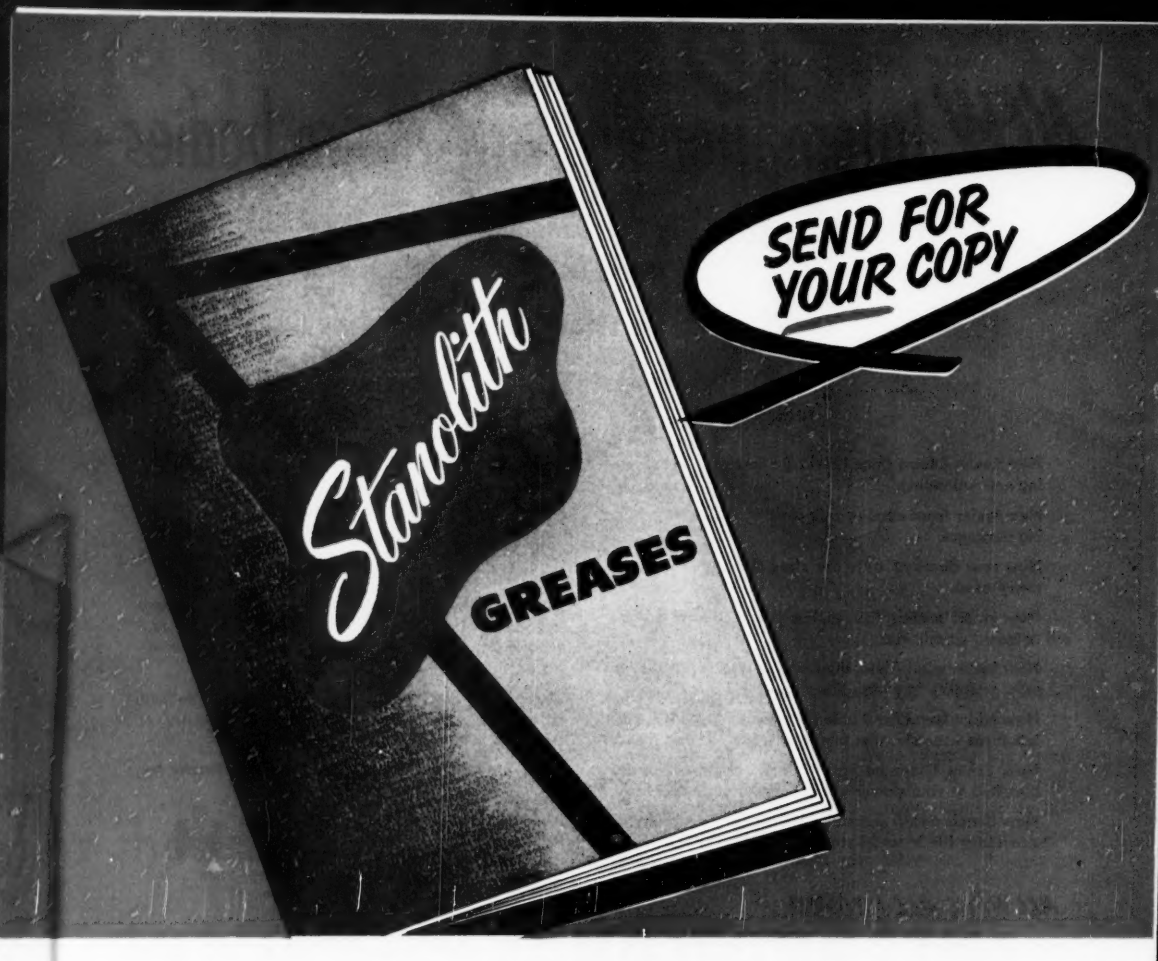
International Harvester Builds
McCormick Farm Equipment and Farmall Tractors
Motor Trucks . . . Industrial Power
Refrigerators and Freezers

Tune in James Melton and "Harvest of Stars"
NBC, Sunday afternoons

ALL NEW, ALL PROVED

INTERNATIONAL TRUCKS

INTERNATIONAL HARVESTER COMPANY CHICAGO



Here's help for bearings in "HOT WATER"

New booklet tells how STANOLITH Greases solve wet-hot problems

HOW TO LUBRICATE bearings which operate under extremely wet conditions, and at the same time, are subjected to high temperatures? If that is one of your problems, the booklet illustrated above holds the solution.

It tells you about the outstanding qualities of Standard Oil's new STANOLITH Greases. It explains why these lithium soap products—unlike soda soap or lime soap greases—will withstand *both* heat and water. The booklet contains evidence of this ability. It gives actual case histories of some of the many different jobs on which STANOLITH Greases have eliminated troubles caused by high temperatures, presence of steam or water, and high speeds. It also describes successful low-temperature service.

Study this wide range of applications. Discover how the two grades of STANOLITH Grease not only can solve difficult lubrication problems but can save you the cost and trouble of stocking and using a variety of special greases. Send for this information. Write for your copy of the STANOLITH booklet today. Simply address your letter to:

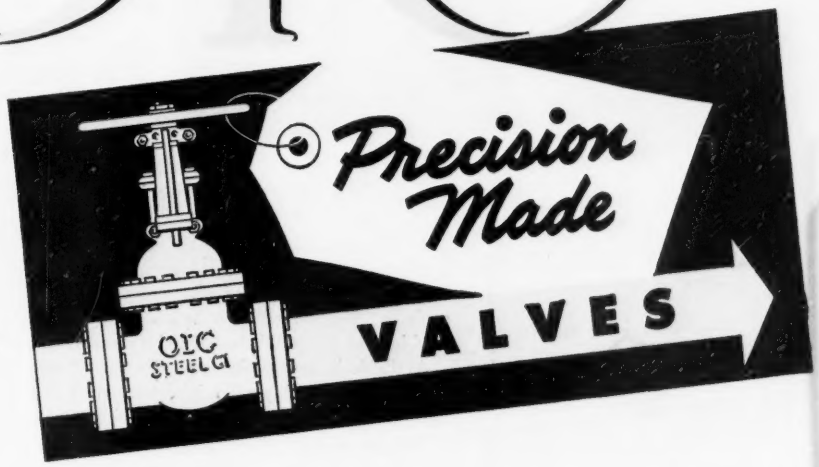
Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

STANDARD OIL COMPANY (INDIANA) STANDARD

JUST SAY

OIC

FOR



For any valving requirement, you can specify OIC Valves and be sure of efficient, precise control. That's because OIC Valves are:

PRECISION ENGINEERED—positive closure . . . minimum friction . . . designed for smooth, free flow of air, gases and liquids.

PRECISION BUILT—every essential part accurately finished for a precise fit, on the most modern production equipment.

PRECISION APPLIED—OIC engineers always available to help you select valves best suited to each job, at lowest cost.

Here's a three-way combination that provides "*precision valve*" *equipment* in your plant. First costs and upkeep costs are lower. See your local OIC distributor, or write us direct. Ask for a free copy of the 1950 OIC Valve Cross-Reference Chart. The Ohio Injector Company, Wadsworth, Ohio.

OIC
FOUNDED 1883

VALVES

FORGED AND CAST STEEL · IRON · BRONZE

IDENTIFICATION DISC: An aluminum marking plate on all Walworth No. 225P's facilitates inventory control and makes reordering quick and positive.

take a good look at the Walworth "500 Brinell" no. 225P Globe

– the Toughest Bronze Valve Your Money Can Buy

The stainless steel, corrosion resistant seats and discs are heat treated to a hardness of 500 Brinell – hard enough to scratch glass and crush nails! The valve can be closed on sand, slag, and pipe scale without injury to the seating surfaces. "Wire drawing" is practically eliminated. All parts are accurately machined and gaged. Years of tight, positive shut-off are assured.

Available in both globe and angle types (angle type: No. 277P) in sizes ¼" to 2", this quality valve is recommended for 350 lbs. W.S.P. at 550 F, and 1000 lbs. non-shock service on cold water, oil, gas, or air.

For full data on this long-life, economical Walworth Bronze Valve, see your local Walworth distributor, or write for Circular.

NEWLY DESIGNED HANDWHEEL: Patented air-cooled, finger-fit handwheel affords sure grip even with greasy gloves.

IMPROVED PACKING: Molded packing of lubricated asbestos reinforced with copper wire. Suitable for practically every service. Valves can be repacked under pressure when fully opened.

note these 7 Great Features

HEXAGONAL UNION BONNET CONNECTION, DEEP STUFFING BOX AND RUGGED STUFFING NUT: Union bonnet connection eliminates any chance of distortion or leakage even though valve is repeatedly taken apart and reassembled.

OVERSIZE STEM: The high-tensile strength silicon-bronze stem assures long life and protection against wear.

SEATS AND DISCS: Plug type seats and discs of stainless steel, heat-treated to 500 Brinell hardness and machined simultaneously to a mirror-like finish, with accurate tapers assures tight positive shut-off with minimum handwheel effort.

EXTRA STRONG BODY: Made of Composition M (ASTM B61) bronze. Thick walls and rugged hexes provide a high safety factor. Valves undergo hydrostatic shell test of 1,000 psi.

WALWORTH

valves and fittings

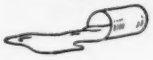
60 EAST 42nd STREET, NEW YORK 17, N. Y.

DISTRIBUTORS IN PRINCIPAL CENTERS THROUGHOUT THE WORLD

POWDERS

TABLETS

FREE FLOWING SOLIDS

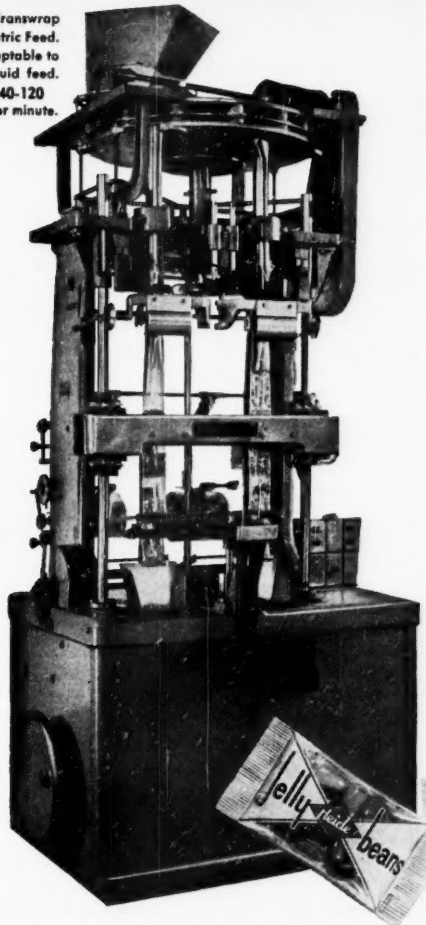


LIQUIDS OR SEMI-LIQUIDS

TRANSWRAP

AUTOMATICALLY COMBINES MINIMUM PACKAGE COST WITH MAXIMUM VERSATILITY

Model "B" Transwrap with Volumetric Feed. Also adaptable to auger or liquid feed. Produces 40-120 pkgs. per minute.



In one machine, TRANSWRAP is a self-contained "packaging department." Using cellophane, Pliofilm, glassine, roll foil or other suitable heat-sealing materials, it forms, fills and seals your package completely automatically.

The same TRANSWRAP machine with suitable feed assembly can package 1 aspirin tablet or 1 lb. of peanuts . . . 1 teaspoon of vanilla extract or 1 lb. of margarine . . . 5 grams of salt or 16 oz. of powdered milk. Package sizes possible range from ⅞" x 2" to 5¼" x 13". They may be either pillow, or "fin seal" type (sealed around four edges).

From the standpoint of economy, TRANSWRAP adjustments and operation are so simple, a single operator can handle a whole battery of machines. Attractive, sales-conditioned TRANSWRAP packages, *filled and sealed*, actually cost *less* than ready-made *empty* bags.

Custom-engineered adaptations are possible on any TRANSWRAP machine to meet your individual requirements with maximum efficiency.

WRITE FOR FREE ILLUSTRATED BROCHURE

Manufactured and Sold by

TRANSPARENT WRAP MACHINE CORPORATION

Route 17 and Henry Street
Hasbrouck Heights, New Jersey

HYSTER DEALERS

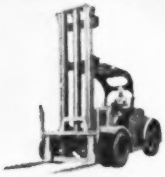
SELL AND SERVICE THE MOST COMPLETE LINE OF INDUSTRIAL TRUCKS ON THE MARKET

HYSTER
LIFT TRUCKS
STRADDLE TRUCKS
MOBILE CRANE

HYSTER 20
Capacity — 2000 pounds
Width — 37 inches
Length — 71 inches (less forks)

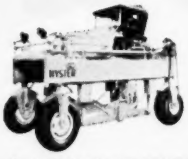
HYSTER 40
Capacity — 4000 pounds
Width — 42 inches
Length — 86 inches (less forks)

HYSTER 75
Capacity — 7500 pounds
Width — 60 inches
Length — 117½ inches (less forks)



HYSTER 150
Capacity — 15,000 pounds
Width — 86 inches
Length — 148 inches (less forks)

M STRADDLE TRUCK
Capacity — 18,000 pounds
Width — 78½ in. and 90½ in.
Length — 176 inches



MH STRADDLE TRUCK
Capacity — 30,000 pounds
Width — 90 in. and 100 in.
Length — 190½ inches

KARRY KRANE
Capacity — 10,000 pounds
Width — 75 inches
Length — 152 inches

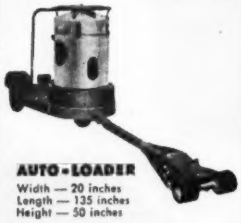
...and now
HYSTER
Salsbury
Turret Trucks

PALLET TRUCK
Capacity — 4000 pounds
Width — 35 inches
Length — 86 in. and 110 in.
Height — 55 inches

TUG
Towing capacity — 20,000 pounds
Width — 42 inches
Length — 62 inches
Height — 50 inches

PLATFORM TRUCK
Capacity — 4000 pounds
Width — 35 inches
Length — 97 in. and 115 in.
Height — 50 inches

CARGO TRUCK
Capacity — 4000 pounds
Width — 42 inches
Length — 103½ inches
Height — 58 inches



AUTO-LOADER
Width — 20 inches
Length — 135 inches
Height — 50 inches

Hyster dealers are located in 37 principal U. S. cities, and in 57 foreign countries. These men and their organizations sell — and more important — service the most complete line of industrial lift trucks, attachments and accessories, on the market today.

Phone your Hyster dealer for demonstration and list of owners. Or use the coupon for literature.

HYSTER® COMPANY

THREE FACTORIES

2902-35 N. E. CLACKAMAS, PORTLAND 8, OREGON
1802-35 NORTH ADAMS ST., PEORIA 1, ILLINOIS
1010-35 MEYERS STREET...DANVILLE, ILLINOIS

HYSTER COMPANY, 2902-35 N. E. CLACKAMAS, PORTLAND 8, OREGON

Please mail Hyster catalogs as checked . . . . .

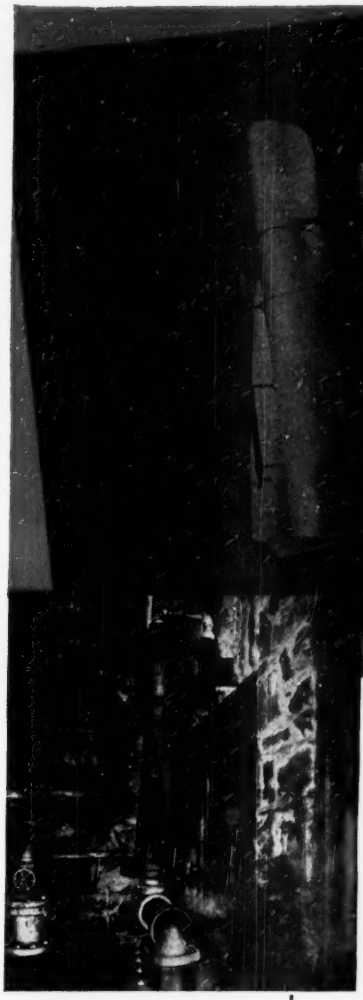
☐ 20 ☐ 40 ☐ 75 ☐ 150
☐ M ☐ MH ☐ KK ☐ Turret

FIRM NAME_____

MY NAME_____

ADDRESS_____

CITY_____ ZONE_____ STATE_____



THIS *ScrubTeam* BEAT THE FUME AND DUST MENACE

OBNOXIOUS, contaminating fumes and vapors—heavy, annoying and dangerous dusts—need not create a major plant problem, *can* be effectively and economically controlled.

To meet and master varying conditions in the battle against this nuisance, SK manufactures a wide range of types and sizes of Vapor Condensers or Fume Scrubbers—a team specially designed for such service.

If your conditions are such that fumes or dust can be knocked down and scrubbed with water or other liquid, an SK Fume Scrubber can do the job economically. Simple in construction, these units produce their own draft and give complete mixing without possibility of by-pass.

Standard and Special Fume Scrubbers are available in various sizes and types of metals for use in the food industry. Send for our Bulletin 4-R for complete information.

The 36″ stainless steel SK Fume Scrubber with auxiliary spray nozzle stack, top view, is used on a battery of fat melters in a meat packing plant. The 6′ cast iron SK Fume Scrubber, lower view, is used on a 4′ diameter x 8′ long, horizontal drum, fat melter. In this case, a large percentage of the fumes is water vapor which must be condensed.

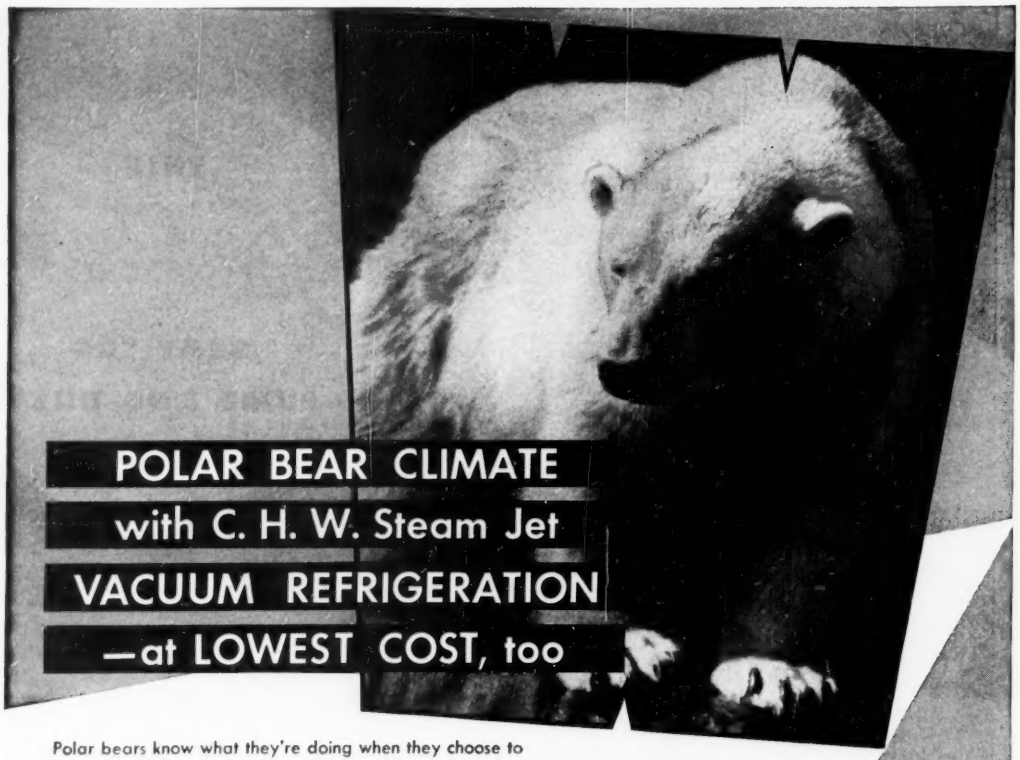
Representatives in: Atlanta, Baltimore, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Denver, Detroit, Houston, Indianapolis, Kansas City, Los Angeles, Memphis, New Orleans, New York, Philadelphia, Pittsburgh, Portland, St. Louis, St. Paul, San Francisco, Seattle, Tulsa, Montreal and Toronto, Canada.

SCHUTTE and KOERTING Company

Manufacturing Engineers

1157 THOMPSON STREET • PHILADELPHIA 22, PA. • TWX No. PH 782

JET APPARATUS • HEAT TRANSFER EQUIPMENT • STRAINERS • CONDENSERS AND VACUUM PUMPS • OIL BURNING EQUIPMENT • ROTAMETERS • FLOW INDICATORS • RADIAFIN TUBES • VALVES • SPRAY NOZZLES AND ATOMIZERS • GEAR PUMPS • DESUPERHEATERS

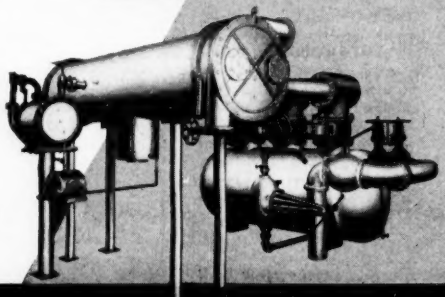


POLAR BEAR CLIMATE with C. H. W. Steam Jet VACUUM REFRIGERATION —at LOWEST COST, too

Polar bears know what they're doing when they choose to remain where they can depend on the constantly cold climate they need. You, too, can equally depend on C. H. W. Steam Jet Vacuum Refrigeration to give you required cooling conditions for your chemical or food process requirements. And, of equal importance, is its economy. When compared to mechanical types of refrigeration, C. H. W. Steam Jet Vacuum Refrigeration Systems are lowest in purchase price, lowest in installation cost and lowest in maintenance. (In many cases, the cost of operating a vacuum refrigeration system is 5 to 20% less than for an ammonia or carbon dioxide system for temperatures ranging from 35 to 60° F.) Furthermore, since water is the refrigerant, hazards of noxious or poisonous ammonia, sulphur dioxide, etc. are eliminated. Cooling is by flash evaporation, using either live or exhaust steam. The system is easily operated and service life is long. For complete information on how C. H. W. Steam Jet Vacuum Refrigeration can be applied to your cooling problem, write now for Catalog No. 1462.

C. H. WHEELER MANUFACTURING CO.
1808 Sedgley Avenue, Philadelphia 32, Pa.
REPRESENTATIVES IN MOST PRINCIPAL CITIES

Photograph below shows a C. H. Wheeler Steam Jet Vacuum Refrigeration System employing a Surface Condenser. Low Level Jet and Barometric Jet (Direct Contact) Condensers can be used, depending on requirements.



C. H. Wheeler SINCE 1903

STEAM CONDENSERS · WATER COOLING TOWERS
EJECTORS · STEAM JET VACUUM REFRIGERATION
OF PHILADELPHIA

SYLVANIA CELLOPHANE

—for stand-out bakery packaging!

Printed Sylvania Cellophane MS-5 in the 300 gauge is used for the overwrap on this cookie package.

—these special properties tailored to your product tell why:

1 Low Cost **3** Sales Appeal
2 Transparency **4** Moisture Protection
5 Easy Application

SYLVANIA® CELLOPHANE

Mr. Cellophane is always available to help you solve your packaging problems. Talk over your requirements with your Sylvania representative or write us mentioning the specific application in which you are interested. Address: Market Development, Dept. F-8

SYLVANIA DIVISION AMERICAN VISCOSE CORPORATION
Manufacturers of cellophane and other cellulose products since 1929
General Sales Office: 1617 Pennsylvania Blvd., Philadelphia 3, Pa.
Plant: Fredericksburg, Va.

Dugan's Butter Rolls and Ernst's Butter Gems go to market in attractive, moisture-proof reusable Visqueen bag with neat, colorful plastic tie.
Bags fabricated by Flexible Package Co.

VISQUEEN* film gives bakery goods longer shelf life, cuts losses from carry-overs

Give us your toughest packaging problem.

Our engineers will be glad to help you solve it—and may save you thousands of dollars. Just mail the coupon!

Important

All VISQUEEN film is polyethylene, but not all polyethylene film is VISQUEEN. VISQUEEN is the only film produced by the process covered by U. S. Patent No. 2461975. Only VISQUEEN film has the benefit of the research and extensive technical experience of The Visking Corporation, pioneers in the development of polyethylene film. Be sure. Always specify VISQUEEN film for superior tear and tensile strength and greater uniformity.

VISQUEEN film . . . a product of The

VISKING CORPORATION—Preston Division, Terre Haute, Ind.

When Dugan Brothers, bakers of Newark and Long Island City, asked Timely Packaging Associates for a new package for their butter rolls, they asked for:

1. **Longer shelf life with complete freshness.**
2. **Better eye appeal.**
3. **Complete sanitary protection.**

Visqueen film was the answer to this major packaging problem. So successful was this first package that similar wraps are being used by dozens of bakers, East and West, for rolls, English muffins, coffee cake and other bakery specialties. It's the "hottest" packaging idea in the bakery industry.

*T.M. The Visking Corporation

☐ Send complete information on new VISQUEEN method of shipping and packaging.

☐ Attached is outline of our toughest packaging problem. How can VISQUEEN film help us solve it? No obligation.

☐ Let's talk it over.

Date.....

time.....

THE VISKING CORPORATION
Box 8P-1410
Preston Division, Terre Haute, Indiana

Name.....

Company.....

Address.....

City..... Zone..... State.....

VODOL-XX is the exclusive product of Refining Unincorporated

GOLDEN BROWN
Naturally
Free-flowing!

VODOL-XX

Famed throughout the industries as the

CORN-OIL LECITHIN

(BONE-DRY)

IN THEIR OWN PRODUCTS—in continuous use of VODOL-XX over long periods—representative food industries have proved its unequalled advantages to their complete satisfaction. Pure virgin corn oil provides nature's finest lecithin! Processing by Refining Unincorporated has brought its incomparable qualities to perfection.

THE BONE-DRY CHARACTERISTIC OF VODOL-XX positively prevents any moisture disturbance. (Important to the chocolate manufacturer.)

Free-flowing VODOL-XX also means

- No pre-heating, pre-dissolving, straining nor thinning
- Instant solubility at low temperatures
- Ready dispersion in fats
- Freedom from lecithin taste and odor in end product
- Longer shelf-life and freshness

Join the others who have found VODOL-XX the most satisfactory on all counts in

Packing Industries • Baking • Confections • Drugs and Cosmetics

All processing using Lecithin

FREE!

VODOL-XX for plant test

Judge VODOL-XX in your own plant—at our expense. *Mail Coupon Today!*

FI-1249

Refining Unincorporated
407 S. Dearborn St., Chicago 5, Illinois

Without obligation, I'll be glad to give VODOL-XX a trial in our plant.

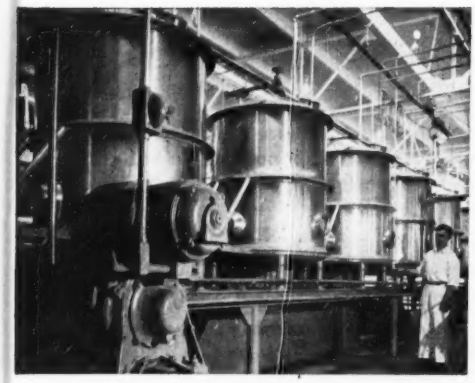
Name _____

Position in firm _____

Firm Name _____

Address _____

For Sanitary Operation without Maintenance Troubles Order *Carpenter* ATF Stainless Tubing



Product purity is safeguarded and maintenance problems are things of the past, when lines are made from Carpenter Stainless Tubing or Pipe.

Freedom from metallic contamination, and the easy-to-clean features of Stainless, are yours when you call the nearest Carpenter Stainless Tubing Distributor.

Clean-up time is being cut down in many a plant where Carpenter Stainless Tubing and Pipe are specified as standard equipment.

Easy assembly with standard valves and fittings is still another advantage. When pipe lines have to be dismantled, the job is easy and quick.

For information on corrosion resistance, sizes, analyses, etc., write for a copy of the Carpenter Stainless Tubing Data File. It contains 12 pages of useful information you can put to work. Just drop us a note on your company letterhead.

THE CARPENTER STEEL COMPANY
Alloy Tube Division, Union, N. J.
Export Department: Woolworth Bldg., New York 7, N. Y., "CARSTEELCO"

Carpenter
STAINLESS TUBING

—guaranteed on every shipment

RUSH SERVICE from Carpenter Distributors or your Cherry-Burrell branch puts the tubing in your plant *when you need it.*

looking for ways to improve distribution?

Let CHEMICAL ENGINEERING and FOOD INDUSTRIES give you an assist with their NEW...

DIRECTORY OF MANUFACTURERS' AGENTS

Serving the Chemical and Food Processing Fields

Containing over 1500 manufacturers' agents specializing in these industries this book provides an economical and handy reference for sales-minded manufacturers of machinery, equipment and supplies.

Conveniently alphabetized by geographical locations and companies, the directory includes names, addresses, branch offices, product lines handled, firms represented and territories covered—all of the vital statistics needed for selection of a manufacturer's agent to serve these fields in any locality.

The price is $10, less than the price of a single newspaper advertisement. Order your copy now. Use the attached coupon. Send cash, check or money order.

Chemical Engineering (ABC)

Food Industries (ABP)

McGRAW-HILL PUBLICATIONS

Business Manager
Chemical Engineering and Food Industries
330 West 42nd St., New York 18, N. Y.

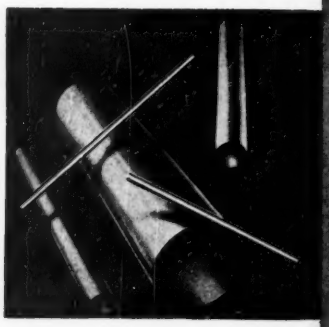
Enclosed is $10 in cash ☐ check ☐ money order ☐. Please send me a copy of "Directory of Manufacturers' Agents serving the Chemical and Food Processing Fields."

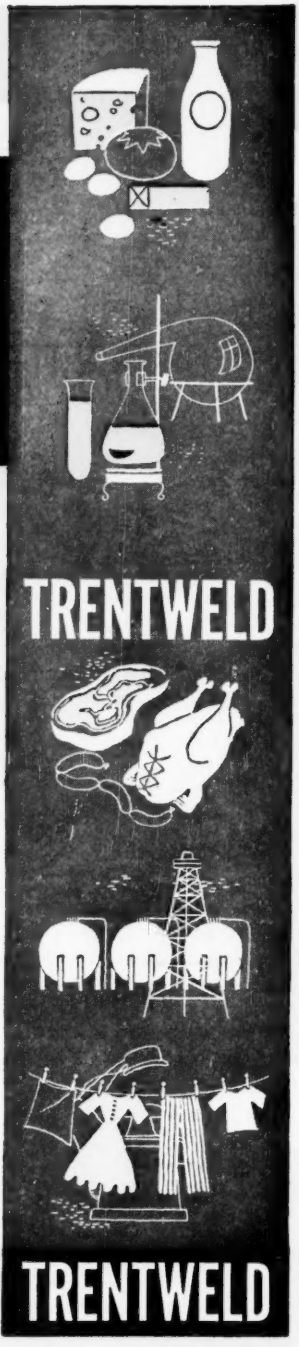
NAME_____

FIRM_____

ADDRESS_____

CITY_____ STATE_____





industry wide...it's TRENTWELD

In processing plants throughout industry where cleanliness, corrosion, heat or abrasion are production problems, more and more engineers and designers are looking to TRENTWELD Stainless Steel Tubing for the answer.

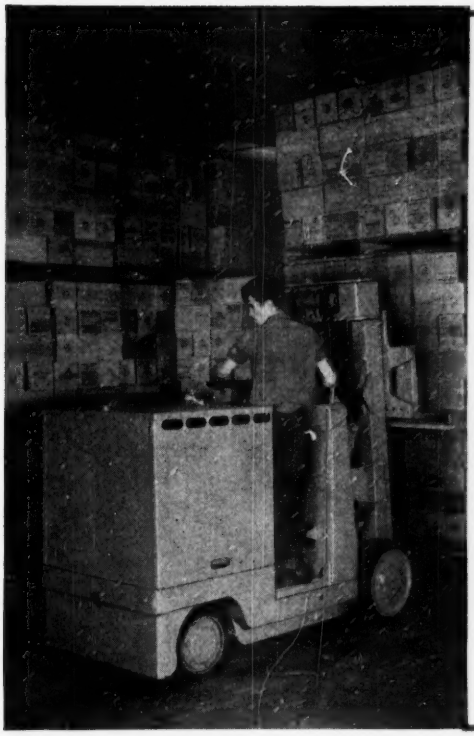
That's because TRENTWELD is made in a *tube* mill by *tube* experts . . . who roll and weld stainless and high alloy tubing *without* added rod metal. Developed by Trent specialists, this method results in tubing that is metallurgically correct and has a uniform section . . . with no zone of weakness for corrosion to attack.

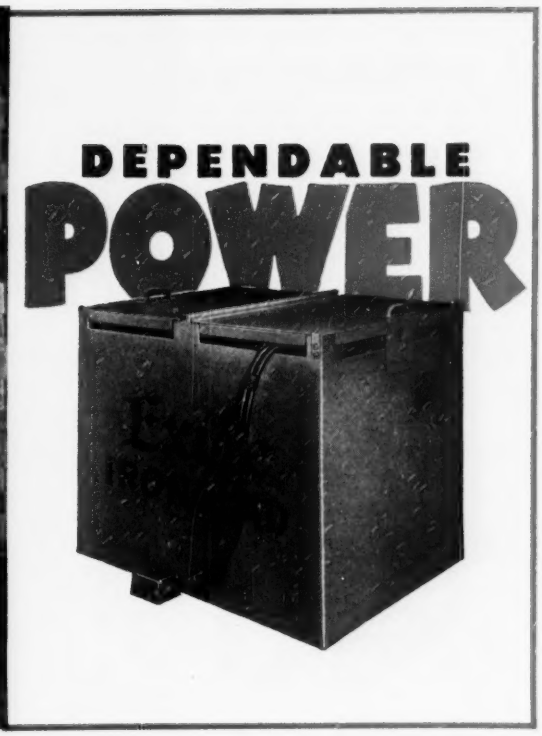
The complete TRENTWELD line . . . $\frac{1}{8}$" to 22" diameter in long lengths and up to 30" diameter in shorter lengths . . . offers a wide range in a variety of grades, gauges and finishes for almost every industrial application.

Whatever your industry, there's TRENTWELD Tubing to fit your design. Our years of experience as tube specialists is at your call. Write us full details about your application.

TRENT TUBE COMPANY
Subsidiary Crucible Steel Company of America
General Offices and Plant: East Troy, Wisconsin
Sales Offices in Principal Cities

STAINLESS STEEL TUBING





You get LOWEST COST OPERATION with

Exide-Ironclad Battery POWER

Exide powered electric industrial trucks assure the lowest costs for truck operation . . . costs for recharging run as low as 2 cents per KWH of battery capacity . . . seldom more than 15 cents per shift to maintain. You gain in many other money-saving ways when your trucks are powered by Exide-Ironclad Batteries. You get:

- instant surge of power to meet all demands in *start-stop, lift-and-shift* manipulations . . . plus finger-tip control for split-second handling, easy maneuvering, accurate spotting.
- full-shift availability, with trucks handling as much tonnage during last hour as first, and at practically no difference in speed.
- high truck availability—freedom from mechanical troubles, and with no unscheduled periods of down time.
- easy to keep charged—batteries absorb a very high percentage of charging current.
- exceptionally long life—proved on more than 100,000 heavy-duty jobs.
- inherent safety—quiet operation with less worker fatigue; no vibration to jar work in transit; no oil seepage on floors to create accident hazards.
- wide range of sizes for every make of battery-electric truck; compact construction permits standardization.

Combined, these and other Exide-Ironclad characteristics assure you dependable performance, day after day . . . for years.

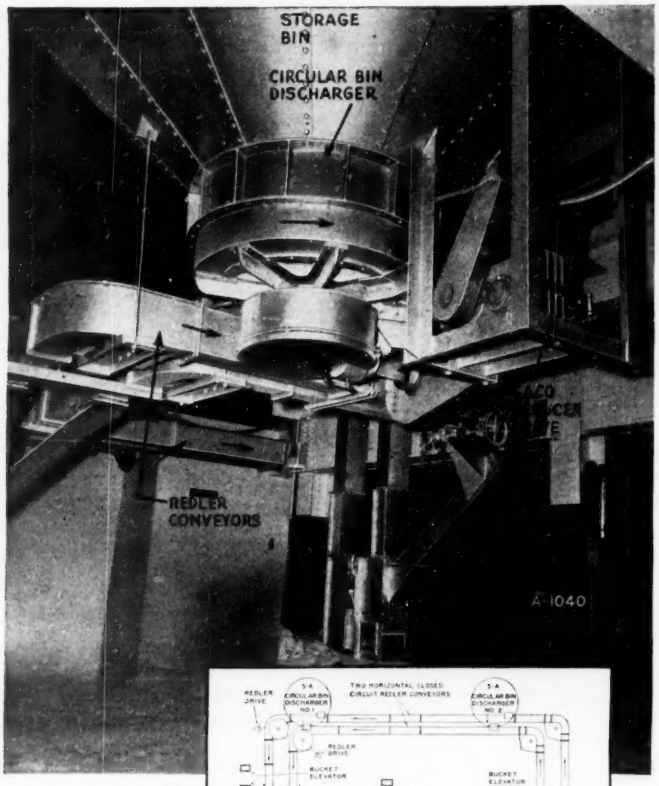
Exide-Ironclad Batteries are the Best Power Buy . . . AT ANY PRICE

Write for more facts and FREE copy of Exide-Ironclad Topics. It contains latest developments in materials-handling . . . shows actual case histories.

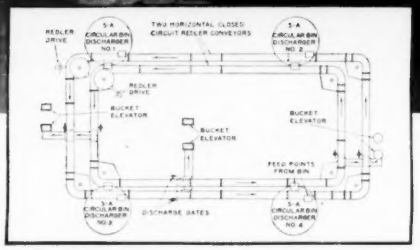
"Exide-Ironclad" *Reg. Trade-mark U.S. Pat. Off.*

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia 32 • *Exide Batteries of Canada, Limited, Toronto*

1888 . . . DEPENDABLE BATTERIES FOR 62 YEARS . . . 1950



Pushbutton Delivery System . . . .



BULK INGREDIENTS READILY FLOW . . . . . IN *CONTROLLED* VOLUME

In the modern plant of this century-old brewery, as well as in many other process industries, a controlled, uninterrupted flow of bulk materials is essential for efficient, economical operations. This S-A handling system moves malt and corn grits from storage to processing quickly and cleanly . . . completely mechanized with pushbutton controls.

S-A Circular Bin Dischargers are teamed up with a pair of horizontal closed-circuit REDLER conveyors. Arching and clogging of materials in bins is eliminated . . . discharge to conveyors is positive, even and quiet . . . no need for vibration or hammering.

If you need a bulk conveyor installation that will give operating convenience with economy, take your problem to S-A engineers . . . they have the experience and the equipment to help you find the low cost solution. Write today.

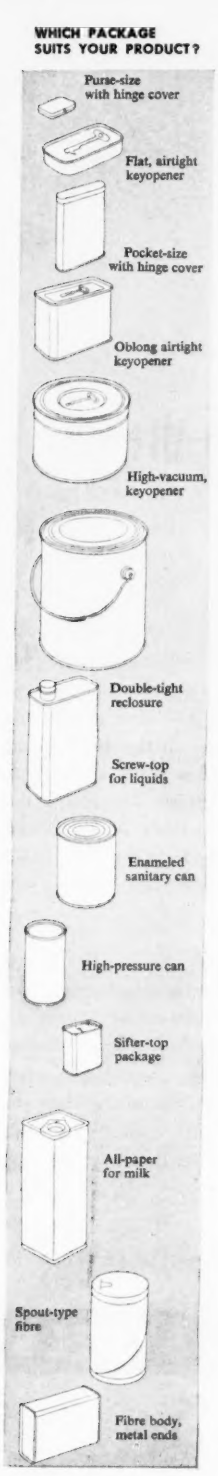
THE F & M SCHAEFER BREWING CO.
Brooklyn, New York

This bulk handling system gives controlled flow of two different materials . . . with quick change-over from one to the other. Projecting finger flights and rotating cone in each S-A Bin Discharger feeds materials through gate controlled spouts to the REDLER conveyors which are arranged concentrically under the four bins. Materials are conveyed around to discharge points where bucket elevators receive and lift materials to brewing operations on upper floors. (see plan view, above) Surplus materials are re-circulated in the closed-circuit REDLERS until needed . . . no danger of overflow.

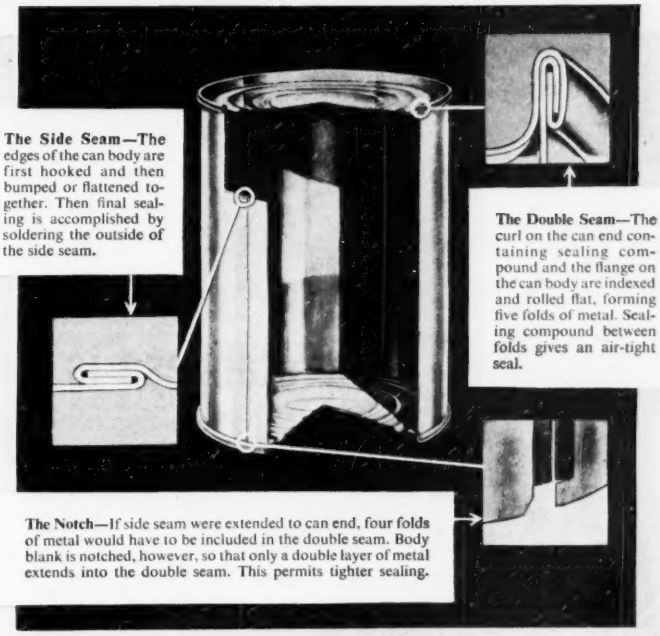
STEPHEN S-A ADAMSON MFG. CO.

6 Ridgeway Avenue, Aurora, Illinois · Los Angeles, Calif. • Belleville, Ontario

DESIGNERS AND MANUFACTURERS OF ALL TYPES OF BULK MATERIALS HANDLING EQUIPMENT



Architecture of the enameled sanitary tin can


The Side Seam—The edges of the can body are first hooked and then bumped or flattened together. Then final sealing is accomplished by soldering the outside of the side seam.
The Double Seam—The curl on the can end containing sealing compound and the flange on the can body are indexed and rolled flat, forming five folds of metal. Sealing compound between folds gives an air-tight seal.
The Notch—If side seam were extended to can end, four folds of metal would have to be included in the double seam. Body blank is notched, however, so that only a double layer of metal extends into the double seam. This permits tighter sealing.

The busiest package in America today

No basic package offers more profit advantages to so many manufacturers.

It moves more food to market than any other container.

Beans and beer; soups and sausages; oils, orange juice or combustion capsules—hundreds of products come to you from your dealers' shelves, fresh and ready, in this sanitary, enameled metal can.

New uses for it are born every day. Maybe a cake mix, or a carbonated drink, or expensive cigars.

Perhaps it's the answer to *your* product's greater success. Whether you now package in glass, paper, fibre or plastic, you owe it to your sales quota to take a look at this versatile carrier.

You can pack it under high-heat or low-cold. You can lithograph it in handsome, come-hither designs.

It keeps air out; can be had in 12 special linings to protect your product's quality, flavor, freshness, and shelf-life. Fills fast; won't break, sift or spill; and you can get it in 179 sizes from tiny 2-oz. to burly 162-oz. Your dealers love its stackability; their customers know it, have faith in it.

Why not let *your* packaging experts get together with *ours?*

We'll help you with your labels, give you cost-cutting ideas and sales-building advice on processing, filling, closing.

Since 1901, Canco has led in packaging.

AMERICAN CAN CO.
CANCO
NEW YORK
CHICAGO
SAN FRANCISCO
HAMILTON CANADA

stainless is no pipe dream

There's no reason to blow smoke rings of fantasy about stainless steels. Since stainless steel is a versatile *family* of steels, the right analysis must be used or stainless will not perform its "miracles" in your application. Crucible, pioneer in the development of these specialty steels, makes freely available to you an alert staff of metallurgists — experts in the application of stainless. Crucible's engineers and metallurgists can show you the right grade and finish you need . . . and how Crucible Stainless offers you maximum satisfaction.

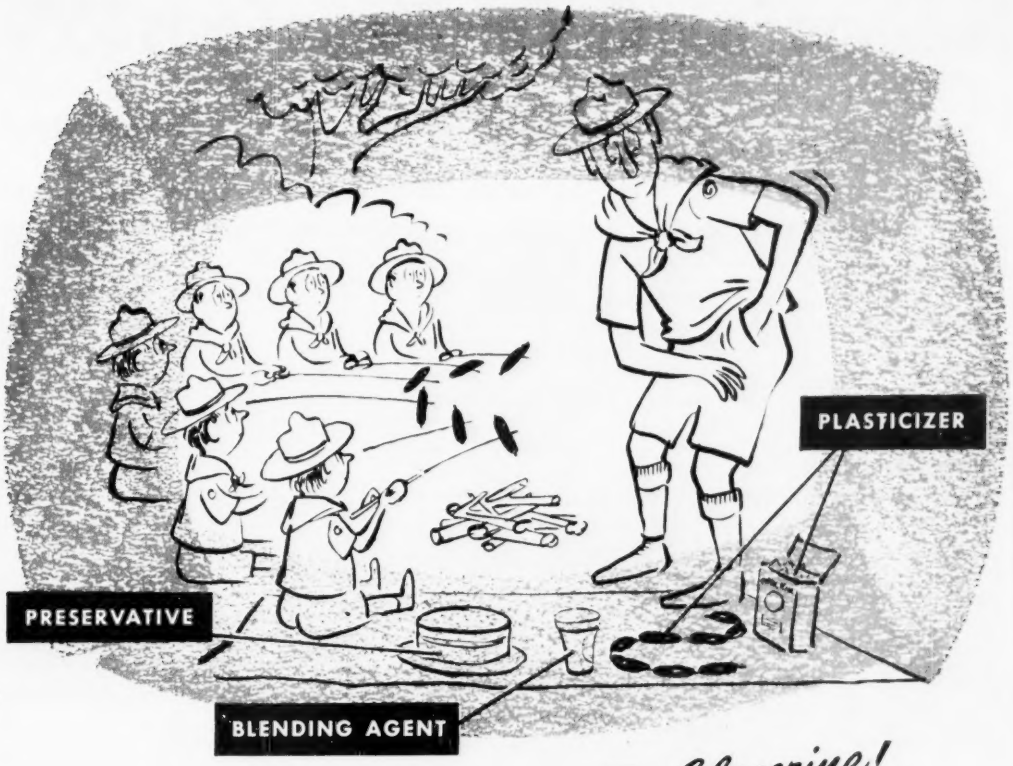
Whatever your application may be, Crucible is prepared to help you. Crucible's half century of specialty steel leadership is based on finding the best way to solve Industry-posed problems. Whether the order is in tons or pounds . . . your application will receive this same careful attention. When you think of stainless . . . call Crucible. CRUCIBLE STEEL COMPANY OF AMERICA, Chrysler Building, New York 17, New York.

CRUCIBLE first name in special purpose steels

STAINLESS STEELS

fifty years of Fine *steelmaking*

STAINLESS • HIGH SPEED • TOOL • ALLOY • MACHINERY • SPECIAL PURPOSE STEELS



One item you can't forget—Glycerine!

TODAY—versatile Glycerine crops up again and again as an ingredient in a variety of food staples, candies, ice cream and beverages! Because it is *absolutely safe to use*, and actually wholesome and nutritious—it has become a standard sweetener, humectant, solvent, preservative and blending agent in innumerable food products. Are you sure you're familiar with the prominent role Glycerine plays in food processing? The numerous applications listed in "*Why Glycerine for Foods?*" may surprise you! Why not write for a free copy?

TOMORROW—Glycerine will be widely used in food packaging as well—and its proven non-toxicity has already rendered it an invaluable adjunct in the manufacture of food wrappings and sausage casings. Its possibilities in improving the appearance and palatability of dried fruits is indicated by a patent which has recently come into public domain. The process consists essentially of spraying or immersing the fruit in glycerine or an aqueous solution thereof which is said to retard drying out and crystallization in storage. Full details will be sent on request.

Nothing takes the place of Glycerine

GLYCERINE PRODUCERS' ASSOCIATION
295 Madison Avenue, New York 17, N. Y.

PLEASE SEND A COPY OF
"WHY *Glycerine for Foods?*" ☐ 8

Please send further information on dried fruit process ☐

Name_____

Title_____

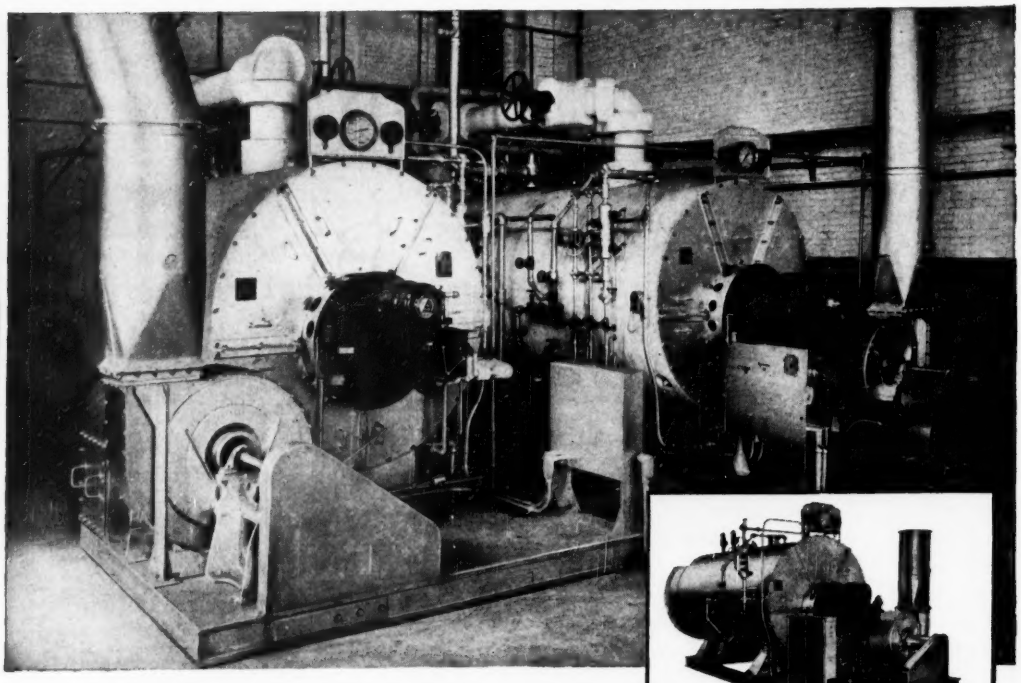
Company_____

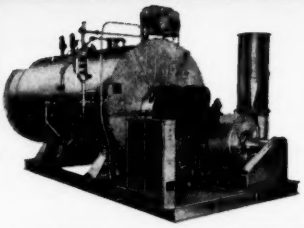
Address_____

City_____ Zone____ State_____

Habitant Soup Co. Cuts Steam Costs 35%

with Preferred Units





Here's what the Habitant Soup Co. of Manchester, N. H., reports: *"More than two years ago we installed two Preferred Unit Steam Generators and we're frankly amazed at the small amount of fuel they consume to produce more than enough steam for our requirements. In fact, they cut our fuel bills by 35%.*

"Maintenance of the Preferred units is practically nil because they are fully automatic. We're glad to report that both boilers are working like a charm."

There are a host of good reasons for these savings. Fuel costs go down, for example, because Preferred Unit Steam Generators offer fully automatic operation with inexpensive No. 6 oil. But Preferred units assure *even more* than appreciable, immediate returns on your investment. They are designed to give *continuing economical* operation for at least 25 years.

For proof, read the 25-year features in the panel at right. For full details, send for Bulletin 1000.

PREFERRED UTILITIES MFG. CORP.

1860 BROADWAY, NEW YORK 23, N. Y.

8 PREFERRED 25-YEAR FEATURES

- **4-pass, high velocity, gas travel—minimizes tube cleaning maintenance by self-cleaning action.**
- **Staggered tube construction — minimizes the possibility of tube pitting, even at low firing rates.**
- **Preferred-built 4700 rpm Horizontal Rotary Oil Burner—assures fully automatic operation even with No. 6 oil.**
- **Anti-stress deck for tube sheet protection.**
- **Self-cleaning *induced draft* fan with air cooled shaft and bearings—built to last 30 years.**
- **Down-draft gas travel for 80% thermal efficiency—proved and guaranteed.**
- **Special *precipitator* developed by Preferred as aid to safe and clean operation.**
- **Dual purging cycles for positive elimination of gas stratification.**

PR-191

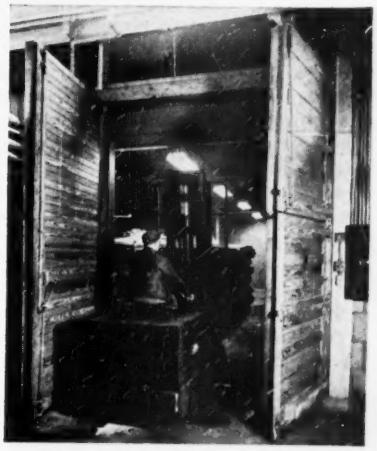
PREFERRED UTILITIES MFG. CORP.

JAMISON Doors Open Wide at CANADA DRY

to speed materials handling

This double cold storage door with an opening 9′ x 12′ permits the entry of loaded fork lift trucks and the moving of equipment into the refrigerated processing space. For entry of personnel, the lower part of the right hand door can be opened without opening the rest of the door.

Whether you have unusual size requirements such as those illustrated or merely require a standard cold storage door, there is a Jamison door to fit your needs.



For full information on the Jamison line of cold storage doors, write for Catalog 175.

JAMISON
HAGERSTOWN, MARYLAND, U. S. A.

The leader for over 50 years

JAMISON COLD STORAGE DOOR CO. • HAGERSTOWN, MD., U. S. A.

YOU CAN BE **SURE**.. IF IT'S

Westinghouse

A Thought for Food:

EXPLOSION-PROOF..

yet it blows outages out of the picture!

In any location where Class II Group G and Class I Group D explosive materials or atmospheres present a hazard, you can operate this Life-Line explosion-proof motor safely. And, cut motor outages while doing it.

Heavy steel construction provides greatest protection against physical damage. A special primer . . . multiple coats of Thermoset varnish, plus a nitrocellulose base finish . . . give bonus protection against corrosion. Use this Life-Line for really tough physical and corrosive jobs. It can take it! Tests show it; on-the-job performance proves it.

In fact, operating records of nearly half a million Life-Line motors show: twice as good performance as the best motor built by Westinghouse in 58 years.

That kind of performance is certainly worth having! It's available in Life-Line motors at no extra cost.

Check your Westinghouse Representative for complete facts on this advanced line of motors. Available are: dripproof, splashproof, totally-enclosed, explosion-proof and sanitary motors. Ask for a copy of "Life-Line Motor", B-3842, or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-21558

— If you figure LIFE-COSTS . . . you'll figure LIFE-LINE —

Westinghouse
Life-Line
Motors
INDUSTRY'S LEADING MOTOR

Rugged STAINLESS STEEL STAYS NEW

YEARS AFTER OTHER TRAILERS ARE COMPLETELY WORN OUT!

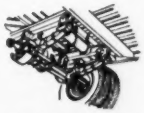
Fruehauf Stainless Steel Trailers keep "roaster fresh" coffee rolling for The Fleming Co., Topeka, Kansas.

FRUEHAUF Stainless Steel Trailers are the hard-boiled highway huskies users can load to the limit — up to 4000 lbs. more than conventional units — and roll without let-up *day in* and *day out,* year after year. Long after other Trailers are completely worn out, Fruehauf Stainless Steel Trailers are still going strong . . . still as sound and tight as the day they were built. The reason: *all their basic structural members are built of the world's lightest, strongest structural material — corrosion-resistant Stainless Steel.* It's the wonder metal that never needs painting . . . won't rust out. To this day there's no record of a Stainless Steel Trailer *ever having worn out.* That's why it'll pay you to build your hauling fleet on Fruehauf Stainless Steel Trailers. You'll find your first cost is virtually your last. FRUEHAUF TRAILER CO., Detroit 32, Los Angeles 58. In Canada: Weston, Ont.

WHEN YOU BUY FRUEHAUF STAINLESS STEEL, YOU GET ALL THESE *IMPORTANT ADVANTAGES!*

All basic structural members are built of the world's strongest lightweight structural material.

Gravity-Tandem gives better springing, better braking because it employs torsion bars.

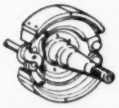


"Multi-Rate" Suspension gives better springing from no load to over-load.

Vertical 2-Speed Supports save time. Aluminum cuts weight up to 135 lbs.

Magnesium floors cut hundreds of pounds of dead weight . . . without sacrificing strength.

Aluminum wheels save up to 107½ lbs. per axle over conventional steel wheels.



Pressed steel brake shoes save 40 lbs. per axle . . . afford smooth stops with heaviest loads.

A full staff of qualified engineers are available to help you with special problems.

Sleek streamlined styling identifies your operation with the most advanced hauling equipment on the road.

80 Factory Service Branches, coast-to-coast, offer you the best Trailer service in the world.

Only **FRUEHAUF** *builds STAINLESS STEEL TRAILERS!*

Put more opportunity into your company's future

WITH THIS FIVE-STEP PROGRAM

Here's an easy-to-follow program that will substantially increase your company's chances for a prosperous future.

Nation-wide experience in 20,000 companies proves that this popular program also pays off handsomely *today*. It increases each participating employee's peace of mind—making him a more contented, more productive worker. It reduces absenteeism, lowers accident rates, increases output, and improves employee-employer relations!

This program is simply a proved formula for building membership in the Payroll Savings Plan—the "automatic" system by which millions of workers are investing in U. S. Savings Bonds every pay-day.

What Are the Five Steps?

The benefits of the Payroll Savings Plan to your company are in proportion to the percentage of employees who participate. Nation-wide experience indicates that 50% of your employees can be persuaded to join *without high-pressure selling*. Here are five steps which have proved to be the "magic formula" for putting over the Plan. They will get results for you:

1. See that a top management man sponsors the Plan.
2. Secure the help of the employee organizations in promoting it.
3. Adequately use posters and leaflets and run stories and editorials in company publications to inform employees of the Plan's benefits to them.
4. Make a person-to-person canvass, once a year, to sign up participants.

These first four steps should win you 40-60% participation. Normal employee turnover necessitates one more step:

5. Urge each new employee, at the time he is hired, to sign up.

Check up on the Payroll Savings Plan in your company. If fewer than half of your employees are participating, you have a lot to gain by following the five-step program outlined here. All the help you need is available from your State Director, U. S. Treasury Department, Savings Bond Division. While it's on your mind, why not call him right now? Or write the Treasury Department, Washington 25, D. C.

Are You With It?

In the current national Savings Bonds campaign, May 16-June 30, the Treasury Department asks each company operating the Payroll Savings Plan to canvass all employees, with the goal of having at least half of them signed up by the end of the month. This advertisement tells how you can achieve that goal most easily.

The Treasury Department acknowledges with appreciation the publication of this message by

McGRAW-HILL PUBLICATIONS

This is an official U. S. Treasury advertisement prepared under the auspices of the Treasury Department and The Advertising Council.

Within easy REACH!

Not One, Not Two, But FIVE Conveniently located Betner Plants

make our food packaging service flexible and economical

DEVON, PA.
RICHMOND, VA.
APPLETON, WIS.
PARIS, TEXAS
LOS ANGELES, CAL.

Pinpointed for service to food processors everywhere . . . that's the big idea behind the locating of these Betner Better Bag plants. Where do you have your business? What kind of bag do you need for your product? Betner has it . . . and can get it to you quickly.

Backing up our idea of what a complete bag service should be is a widely-flung sales organization, one or more members of which are near you. Betner Bags are, in effect, as close to you as your classified directory.

Your product will GO safely in one of these types of bag

Foil
Wax-glassine
Duplex-wax-glassine
Laminated wax-glassine
Cellophane

Betner bags are "proofed" against . . .

moisture-vapor
grease
insects
water
sifting

Many Betner bags are THERMOSEAL*-ed

This is our patented, heat-sealed closure which gives up to 20% greater protection.

*Trade Mark Reg. U. S. Pat. Off.

Benj C Betner Co DEVON, PA.

CAMP BETNER CORP., Richmond, Va.; BENJ. C. BETNER CO. of WISCONSIN, Appleton, Wisconsin; BENJ. C. BETNER CO., Paris, Texas; BENJ. C. BETNER CO. of CALIFORNIA, Los Angeles, California.; SOUTHERN PACKAGING CORPORATION, High Point, N. C.; Affiliate of Benj. C. Betner Co.

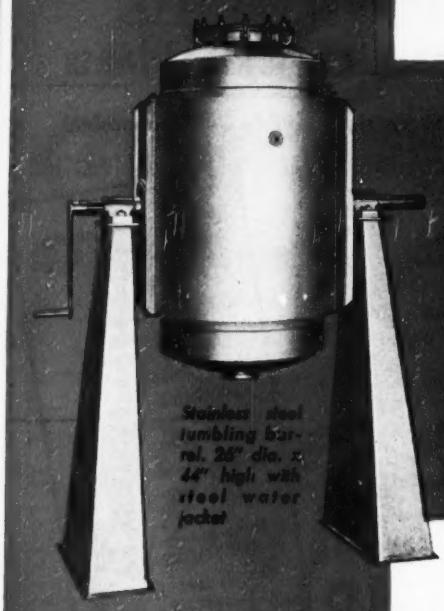
A complete bag service—from idea to finished bag to machinery for closing coffee bags and filling and closing liner bags for cartons.

BACK IN THE 1880's

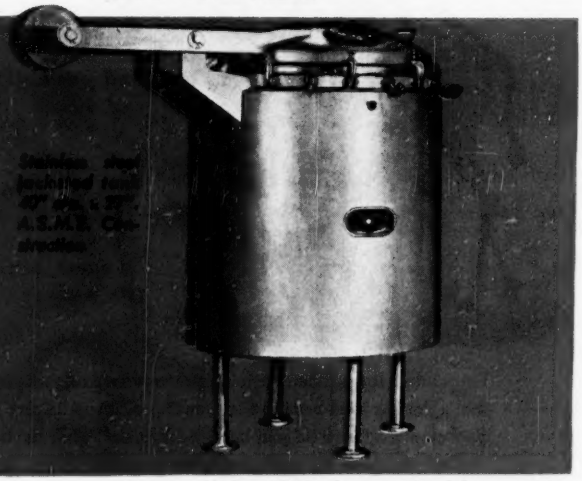
WHEN WATERMAN DEVELOPED THE FOUNTAIN PEN

Koven

WAS MAKING INDIVIDUALIZED FOOD EQUIPMENT



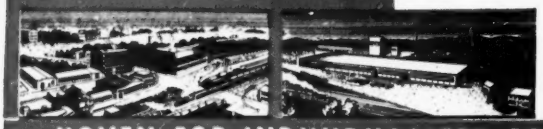
Stainless steel tumbling barrel, 28" dia. x 44" high with steel water jacket



Stainless steel jacketed tank 27" dia. x 27" A.S.M.E. Construction

L. O. KOVEN & BRO., INC.
154 Ogden Ave., Jersey City 7, N.J.

Plants
Jersey City, N. J. Secaucus, N. J.

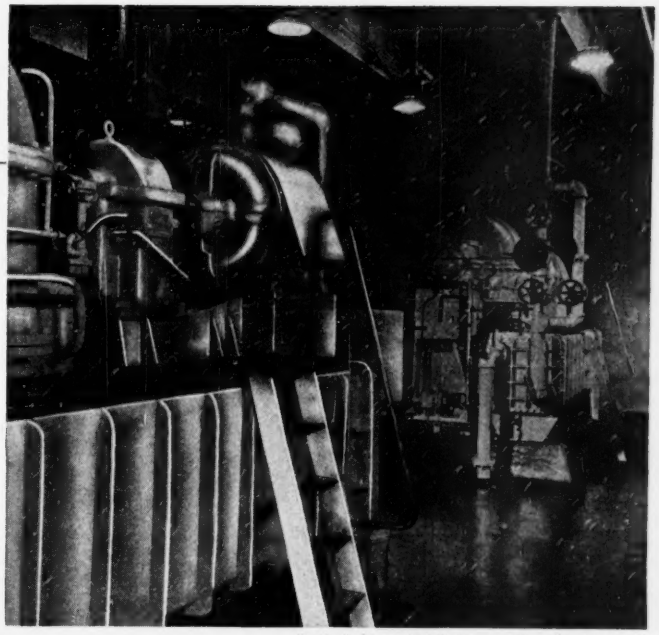


Always a leader, KOVEN has specialized for over 69 years in the development of individualized food equipment that meets specific requirements. Without obligation, a representative will explain how KOVEN experience can help increase your production and decrease cost. In our two vast plants are: machine, welding, painting, galvanizing shops. X-ray inspection insures quality control. Call or write KOVEN today.

KOVEN products in all commercial and non-corrosive metals include: Stainless Steel; Aluminum Sheet Fabrication; Boxes, Tote, Waste Cans; Chemical Apparatus; Coils and Pipe Bands; Copper Sheet Fabrication; Galvanizing Work; Mixers, All Kinds; Monel Metal Fabrication; Pails, Special Heavy; Pans, All Types, All Metals; Sinks, Scullery and Factory; Tables, Galvanized or Monel; Tanks, All Types, All Metals; Kettles, All Types, All Metals.

KOVEN FOR INDIVIDUALIZED FOOD EQUIPMENT SINCE 1881

LARGE INSTALLATION



Typical of large installations are these Carrier units in a modern beverage plant

OR

SMALL

A small 5-h.p. General Electric unit supplies refrigeration for freezing and holding rooms in an ice cream plant.

In the frozen food business...

It pays to play it safe with "Freon" refrigerants!

Safe refrigeration may mean the difference between profit and loss . . . success or failure in today's highly competitive frozen food business.

That's why so many owners, operators and plant managers are careful to select equipment designed to use "Freon" refrigerants exclusively.

These refrigerants are so safe that architects and engineers unhesitatingly recommend refrigeration systems that utilize "Freon" for frozen food operations.

"Freon" refrigerants are nontoxic, nonflammable and nonexplosive . . . harmless, tasteless and practically odorless. They won't contaminate food—even if leaks should develop. And since they are pure and contain no acids, "Freon" refrigerants won't corrode or otherwise harm equipment.

In fact, "Freon" refrigerants actually help prevent equipment breakdowns. For their exceptional dryness greatly reduces the risk of "freeze-ups" and provides protection against the formation of abrasive sludges.

These many advantages make "Freon" refrigerants the logical choice for every type of food-freezing operation. When you plan your next refrigeration installation—large or small—be sure to plan also for maximum safety and economy. Play it safe by selecting only equipment designed to use "Freon" safe refrigerants.

Kinetic Chemicals, Inc., Tenth and Market Sts., Wilmington 98, Delaware.

KINETIC

FREON

REG. U.S. PAT. OFF.

SAFE REFRIGERANTS

"Freon" is Kinetic's registered trade-mark for its fluorinated hydrocarbon refrigerants.

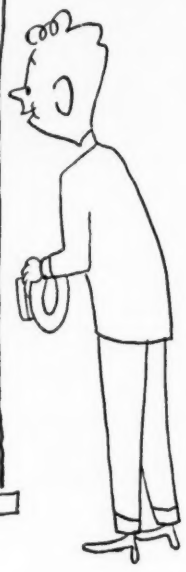
Strawberry Social here tonight!

-and of course everybody will come-

There's **NORDA STRAWBERRY** flavor

In the ice cream and cake -

TRY SOME



Good old-fashioned real strawberry flavor is a good old summertime favorite. Norda Strawberry Flavor is crammed with the true-fruit richness.

Try it. Test it. And taste it. We believe you'll agree it is good—very good. Don't you like that *more strawberry* taste?

Both Norda genuine Strawberry and fine imitation Strawberry will help you make better-tasting, *better-selling* gelatins, mixes, candies, syrups, and baked goods.

Send for *free samples* today. Ask for your Norda Flavor Catalogue, too. Come to Norda for *successful* flavors.

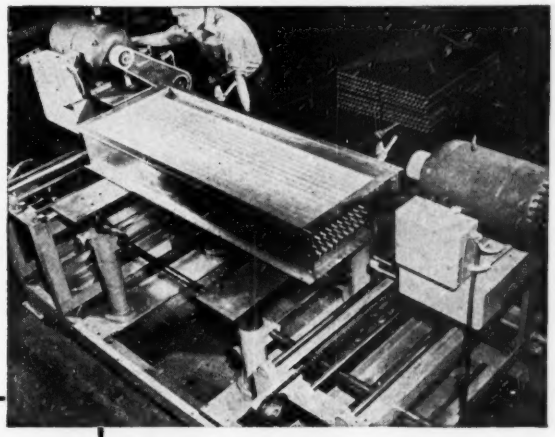
Norda Strawberry . . .

Another "Favorite to Flavor It"

Norda ESSENTIAL OIL AND CHEMICAL COMPANY, INC.
601 West 26th Street, New York 1, N. Y.

CHICAGO • LOS ANGELES • ST. PAUL • MONTREAL • TORONTO • HAVANA • MEXICO CITY • LONDON • PARIS

Special coil manufacturing equipment assures uniformity of coil quality and dependability.



In cooling or heating coils

Sturtevant

GIVES YOU PROVEN PERFORMANCE

For practically every cooling or heating application, you will find a Sturtevant coil that fills your needs. Because it is built under rigid specifications by skilled craftsmen using specialized equipment, it will be a quality product—with performance *proved* through years of successful installations.

Take the U. S. Department of the Interior Building in Washington, D. C., as an example. The thousands of Sturtevant coils installed there in 1934 have performed perfectly ever since. This is only one of many installations with a record of 15 years or more of efficient service.

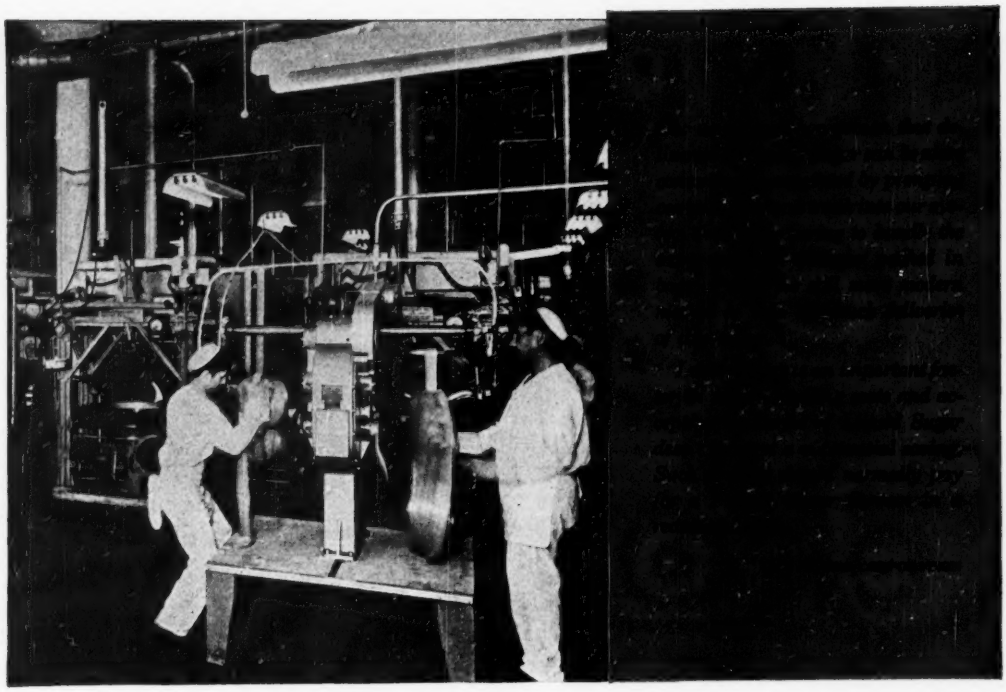
Sturtevant's complete, standardized line contains all types and sizes of heat transfer coils. They are available in a wide range of capacities, with aluminum or copper fins that offer minimum resistance to air flow and are easy to clean.

By specifying Sturtevant, you are assured of long coil life at rated performance . . . the product of sound engineering, modern tooling and first-class workmanship. Call your nearest Westinghouse Sturtevant Office, or write to Westinghouse Electric Corp., Sturtevant Division, Hyde Park, Boston 36, Mass.

YOU CAN BE SURE...IF IT'S

Westinghouse

J-80187



CANDY MANUFACTURERS WHO USE *FLO-SWEET*® SAVE $,$$$ EVERY YEAR

Users' experiences prove that such important savings are typical whenever liquid sugar replaces dry sugar. The fact that three easy mechanical operations do the work of 10 back-breaking storage and handling operations is one quick indication of how Flo-Sweet cuts costs.

Users' experiences prove, too, that there's no substitute for—nothing "just as good" as Flo-Sweet experience, Flo-Sweet "know-how," Flo-Sweet service.

THESE ARE FACTS:

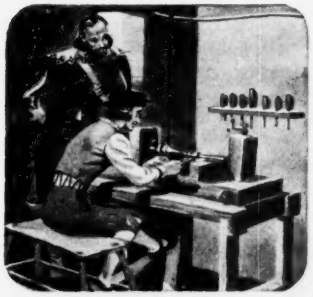
- Flo-Sweet made the first liquid sugar for bulk distribution 27 years ago.
- Flo-Sweet engineered and supervised 90% of the liquid sugar installations in the areas it serves.
- Flo-Sweet has the sugar industry's outstanding Research Laboratory.
- Flo-Sweet serves you with the largest fleet of tank-trucks, tank-cars and tank-ships handling liquid sugar today.
- Flo-Sweet is the only liquid sugar supplier in the East maintaining storage facilities away from the refinery for customer service.

Therefore, when you get Flo-Sweet you get *more* plant assistance, product research and improvement, product control, and always-dependable service . . . *AND THOSE ARE THE THINGS THAT SAVE YOU $,$$$ EVERY YEAR*

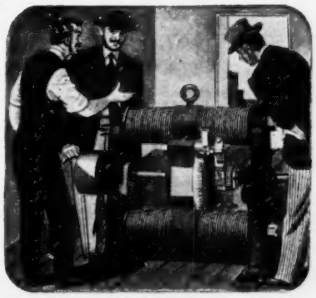
flo-sweet

REFINED SYRUPS & SUGARS, INC.

PIONEERS IN LIQUID SUGAR FOR SAVINGS, SANITATION AND SERVICE



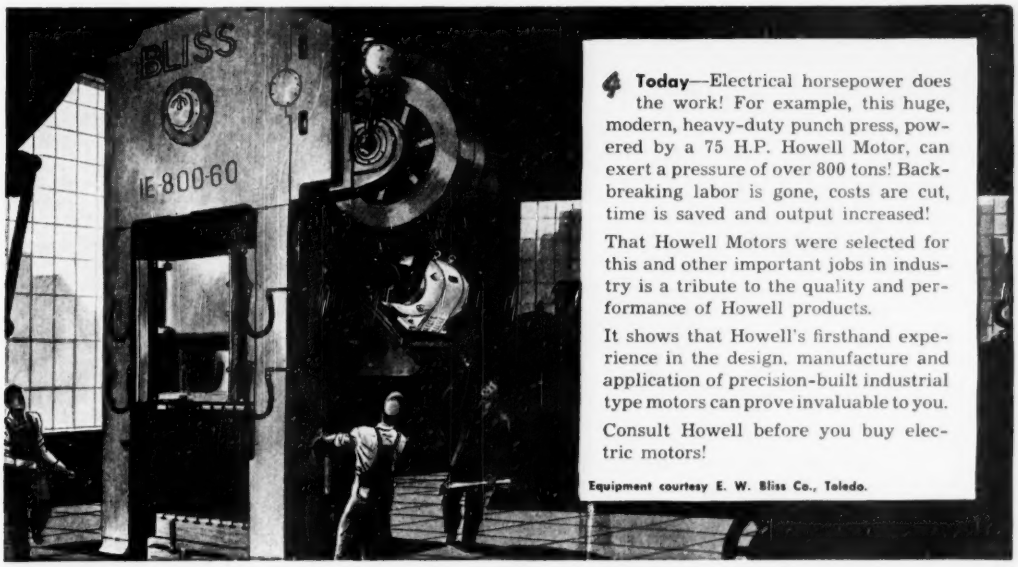
1 1600—Man worked hard for his pay in these days. Crude machines like this began to lighten his load by replacing laborious handwork with foot power. But progress was really only beginning.



2 1875—By accident, it was discovered that if two direct current dynamos were connected together, one would serve as a generator and drive the other as a motor. Electrical horsepower was here!

3 1900—Result: Electrical horsepower replaced foot power! By 1915, Howell "Red Band" Electric Motors arrived. Soon, these rugged, industrial type motors were widely accepted in many industries.

NOW...A PUNCH PRESS WITH A PUNCH!



4 Today—Electrical horsepower does the work! For example, this huge, modern, heavy-duty punch press, powered by a 75 H.P. Howell Motor, can exert a pressure of over 800 tons! Back-breaking labor is gone, costs are cut, time is saved and output increased!

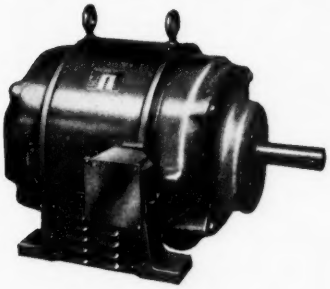
That Howell Motors were selected for this and other important jobs in industry is a tribute to the quality and performance of Howell products.

It shows that Howell's firsthand experience in the design, manufacture and application of precision-built industrial type motors can prove invaluable to you.

Consult Howell before you buy electric motors!

Equipment courtesy E. W. Bliss Co., Toledo.

Free enterprise encourages mass production, supplies more jobs—provides more goods for more people at less cost.



Howell Type F Punch Press Motor

HOWELL MOTORS

HOWELL ELECTRIC MOTORS CO., HOWELL, MICH.

Precision-built Industrial Motors Since 1915

HOWELL Red Band MOTORS

Here's real food for thought:

DODGE trucks are "Job-Rated" for owner profits!

You can fatten your food distribution profits by switching to a truck that fits your job!

And that, of course, will be a Dodge *"Job-Rated"* Truck!

It will have an engine that's *"Job-Rated"* for power to spare—with maximum gas and oil economy.

In fact, every part of your Dodge Truck—from engine to rear axle—will be *"Job-Rated."* That means it will be engineered and sized to haul your food products at lowest cost per ton-mile.

You'll be surprised at the dimes and dollars you'll save with a truck that fits your loads and your roads.

Yes, if your food distribution is profit-starved, see your Dodge dealer. He'll show you a *"Job-Rated"* truck—one that will put your operations on the proper diet!

With all their extra value **DODGE** *"Job-Rated"* **TRUCKS** are priced with the lowest

PROFESSIONAL SERVICES

PROCESSING PROBLEMS — PRODUCT DEVELOPMENT — MARKET RESEARCH — PLANT LAYOUT and DESIGN — PACKAGE DESIGN and TESTING MANAGEMENT — PUBLIC RELATIONS — GENERAL CONSULTING — PATENTS — CHEMICAL, BACTERIOLOGICAL and NUTRITIONAL ANALYSIS

J. Paul Bishop and Associates
Consulting Chemical Engineers and Food Technologists

Reports—Layouts—Canning and Freezing Processes—Food Bacteriology—Sanitary Control—Food Engineering — Atmospheric Pollution — Unit Operations—Process, Product and Equipment Design—Industrial Heating, Ventilating, Air Conditioning and Refrigeration.
Write for brochure—mentioning this publication.
105 North Second Street — Champaign, Illinois

SCHWARZ LABORATORIES, INC.

Chemical and biological analyses of food materials and products. Food plant design, inspection, process examination and control. More than 75 years of experience serving the food and beverage industries.
Write for bulletin
"Science Quality Control of Foods and Beverages"
202 East 44th St. — New York 17, N. Y.

FOOD RESEARCH LABORATORIES, INC.

Philip B. Hawk, Ph.D., President
Barnard L. Oser, Ph.D., Director

Research, Analyses, Consultation for the Food, Drug and Allied Industries.
48-14 33rd Street, Long Island City, N. Y.

BENJAMIN F. SMITH
Consulting Engineer

Designer and Manufacturing of Gentle Pneumatic Conveying Systems
Coffee, beans, spices, nuts
powders, granules, flakes
frozen limas, etc.
1801 Breton Rd., S.E. — Grand Rapids, Mich.

Fridy - Gauker - Truscott & Fridy
Architects & Engineers

Dairy, Canning, Food Process and Industrial Waste Treatment Plants
Water Supply - Incineration - Sewage Disposal
General Architecture and Engineering
Reports - Cost Studies - Drawings - Specifications
1321 Arch Street — Philadelphia 7, Pa.

FOSTER D. SNELL, INC.
Research Chemists and Engineers

A staff of 75 including chemists, engineers, bacteriologists and medical personnel with 10 stories of laboratories and a pilot plant are available for the solution of your chemical and engineering problems. Write today for Booklet No. 13.
"The Chemical Consultant and Your Business"
29 West 15th St. — New York 11, N. Y.

HANSON-GORRILL-BRIAN, INC.
Planning - Development - Design

Process, Control & Inspection Equipment
One Continental Hill — Glen Cove, N. Y.
Glen Cove 4-1922

JOHN I. THOMPSON & CO.
Consulting Engineers to the Food Industries

Mechanical Management and Process Engineering. Investigation and Reports. Plant Layout and Design. Methods and Procedures.
912—17th St., N. W. — Washington, D. C.

LANCASTER, ALLWINE & ROMMEL
Registered Patent Attorneys

Patent Practice before U. S. Patent Office. Validity and Infringement Investigations and Opinions. Booklet and form "Evidence of Conception" forwarded upon request.
Suite 457, 815-15th St., N. W.
Washington 5, D. C.

DONALD K. TRESSLER & ASSOC.
Food Technologists and Engineers

Specialists in Food Preparation and Preservation; Equipment Testing and Evaluation; Food Freezing; By-Product Utilization; Manufacture of Pure Fruit Flavors.
North Compo Road — Westport, Conn.

LEWIN ASSOCIATES
Industrial Consultants

DAVID N. LEWIN, Ph.D., FOOD CONSULTANT
JOSEPH D. LEWIN, CONSULTING ENGINEER
Designs—Layouts—Investigations — Consultations, —Reports—Market Investigations—Bakeries, Dairy Products—Food Preserving by Heat, Drying, Freezing—Consultation in Managing, Warehousing, Distribution—Formulae, New Products.
1775 Broadway, N. Y. 19, N. Y. COlumbus 5-5276

Truman B. Wayne & Associates
Consulting—Designing—Supervising Architects • Chemists • Engineers

Product & Process Development
Economic Investigations & Reports
Plant Layout & Design
Illustrated Brochure on Request
1011 Waugh Drive — Houston 6, Texas

MODERN VINEGAR SERVICE

Large recirculating vinegar making units to fit any requirements. Design, Installation, Operation, Alterations, Consultation.
P. O. Box 103, Station M
Los Angeles 32, Calif.

BERT W. WHITEHURST
Registered Professional Engineer

Reports, design, plant modernization consultation
53 State Street — Boston, Mass.

GUSTAVE T. REICH
Consulting Chemical Engineer

Continuous Processes — Sugar
Complete Plants — Yeast, Molasses
Alcohol - Dry Ice - Waste
1422 Chestnut St. — Philadelphia 2, Pa

WISCONSIN ALUMNI RESEARCH FOUNDATION
Laboratory Services

Vitamin assays - Proximate analyses
Bacteriological testing of sugars, syrups, starch, water, meats, egg products, and canned foods
Fat and oil constants
Spectrophotometric analyses
P. O. Box 2059 — Madison 1, Wisconsin

WHERE TO BUY

Contains wide range of

NUTRITIONAL RESEARCH PRODUCTS
BIOLOGICAL TEST DIETS
TEST DIET INGREDIENTS
VITAMINS (CRYSTALLINE)
AMINO ACIDS (CRYSTALLINE)
MICROBIOLOGICAL MEDIA
VITAMIN SUPPLEMENTS
RESEARCH BIOCHEMICALS
CAROTENE CONCENTRATES

General Biochemicals, Inc.
50 Laboratory Park, CHAGRIN FALLS, OHIO

CARROT OIL makes foods golden yellow

Carrot oil, like butter, contains carotene. Carrot oil is extracted from carrots, and each pound contains up to 25 million units of carotene, the international standard of vitamin A.
Carrot oil is preferred for vitaminizing foods because it is a natural vegetable oil, and because it contributes vitamin A of high stability and desirable golden yellow color. Carrot oil is not synthetic, does not contain animal fats of any kind, and does not produce fishy flavor.

SEND FOR BOOKLET
New 36-page combined catalog on carrot oil for foods, feeds, and pharmaceuticals. Important reading for most food processors. Write today!

NUTRITIONAL RESEARCH ASSOCIATES
205 Broad St., South Whitley, Ind.

CORROSION-PROOF TANKS & FLOORING

- Corrosion-proof construction of processing and storage tanks; industrial flooring.
- Experience serving major steel, chemical, textile, food plants.
- Complete Facilities: Design . . . Engineering . . . Materials . . . Construction . . . Maintenance.

Write for bulletin giving full data
601 Chemsteel Building, Walnut Street, Pittsburgh 22, Pa.

CHEMSTEEL CONSTRUCTION COMPANY, INC.
Specialists in Acid-Proof Construction

SEARCHLIGHT SECTION

EMPLOYMENT • BUSINESS • **OPPORTUNITIES** • EQUIPMENT—USED or RESALE

UNDISPLAYED RATE:
Not available for equipment advertising
$1.20 a Line—Minimum 4 Lines.
To figure advance payment count 5 average words as a line.
INDIVIDUAL EMPLOYMENT WANTED undisplayed advertising rate is one-half of above rate, payable in advance.
PROPOSALS, $1.20 a line an insertion.

INFORMATION:
BOX NUMBERS in care of any of our New York, Chicago or San Francisco offices, count as one additional line.

DISCOUNT OF 10% if full payment is made in advance of four consecutive insertions of undisplayed ads (not including proposals).

DISPLAYED RATE:
The advertising rate is $9.50 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

AN ADVERTISING INCH is measured ⅞ inch vertically on one column, 3 columns—30 inches—to a page.
F.I.

NEW ADVERTISEMENTS received by 10 A. M. August 22nd at the New York Office, 330 W. 42 St., N. Y. 18, N. Y. will appear in the September issue subject to limitations of space available

PLANT MANAGER

All around man for freezing and canning plant in Kentucky. Must be completely familiar with every phase of plant operation from buying to shipping. Excellent opportunity.

P-7143, Food Industries
330 W. 42nd St., New York 18, N. Y.

WANTED SALESMAN

For new jobbing concern servicing Candy Factories, Bakeries, Dairies, and kindred Industries in the East. All replies held in confidence.

P. O. Box 1204, New York 8, N. Y.

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (18)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

FOOD TECHNOLOGIST familiar with flavor formulation and bacteriology to take charge of department. Write giving complete resume of education, experience and salary desired. Write P-6879, Food Industries.

MAN FULLY experienced in the manufacture of all types of Italian Cheese to manage Cheese Department. Also man fully experienced in the making of Scamozza. Salary to right party no object. Write stating experience and references. Cutrufello's Creamery, Inc., 1398 Barnum Avenue, Stratford, Conn.

MALE HELP Wanted. Superintendent and Chief Chemist wanted for large plant contemplating the manufacture of grape juice, grape jelly, and similar products. Please write full details, stating age, education, and past experience. Excellent salary commensurate with ability. All reports confidential. Write only. Commodities Car Co., 700 Exterior Street, Bronx Terminal Market, New York City.

WOMAN BAKING Chemist for position in South. Require M.S. in Cereal Chemistry of Home Economics. Must be interested in baking technology, experimental cookery and statistical evaluation, and have had some experience preferably in a baking laboratory or mill laboratory. Please give full details in first letter addressed to R. F. McCoole, Monsanto Chemical Company, 1700 South 2nd Street, St. Louis, Missouri.

ENGINEER: OPPORTUNITY for graduate engineer or equivalent with some experience in plant layout and machine detail in canning or freezing industry. Excellent opportunity in expanding technical and sales department of leading equipment manufacturer. State personal history, education, experience, references, enclose photograph. P-7252, Food Industries.

CHIEF ENGINEER—To take complete charge of Engineering and Maintenance Departments of Large Mid-West General Line confectionery manufacturer. Must have experience in handling all phases of engineering and maintenance in connection with Hard Candy Moguls, Enrobers, Packaging, Etc. Unusual opportunity for man with requisite qualifications. All replies will be treated confidentially. Reply P-7168, Food Industries.

WANTED—WORKING foreman for food canning plant. State age, experience, references, salary expected in application. P-7326, Food Industries.

FOOD CHEMISTS

JR. AND SENIOR

Investigate our active confidential service for the better position. Appointments at your convenience.
Call, write or wire:—Gladys Hunting (Consultant)

DRAKE PERSONNEL
7 W. Madison St. Chicago 2, Ill.

Engineers - Executives - Technical Men

Salaried Positions, $4,000 to $30,000. This Confidential service for men who desire a new connection, will develop and conduct preliminary negotiations without risk to present position. Send name and address for details.

TOMSETT ASSOCIATES
1203-2 Berger Bldg., Pittsburgh 19, Pa.

POSITIONS WANTED

FOOD TECHNOLOGIST, chemist, plant manager, 8 yrs. experience. Exceptional record food research and development. Presently employed. PW-7071, Food Industries.

ADMINISTRATIVE ENGINEER—Thoroughly experienced in all phases of management in processing and packaging industries. Knows manufacturing, costs, labor relations, finance, sales. Seeking position with leading organization as administrative assistant, general or works manager. B.S.-Industrial Engineering; M.A.-Business, age 40. PW-6959, Food Industries.

SANITATION EXPERT: 18 yrs. experience in food and drug regulatory work. 1 yr. American Institute of Baking, Sanitation Dept. Available to organize and direct sanitation program on industry wide basis. PW-7113, Food Industries.

PLANT MANAGER with 24 years practical experience, Plant lay-out, Purchasing, Manufacturing, Costs, Quality Control, Supervision of Preserves, Jellies, Mayonnaise, Syrups, Fountain and Bakers Supplies, Sauces, Extracts, Canned Fruits, Vegetables, Meats, Soups, other Specialties. Age 40, Married. Available immediately anywhere. PW-7278, Food Industries.

FOOD TECHNOLOGIST-Agronomist, top-notch quality control, production and raw products man. Electronics experience. Desires position with progressive processor. Location immaterial. PW-7307, Food Industries.

FOOD CHEMIST & Technologist, presently employed chief chemist, experience with all types of foods. Particularly experienced with candy technology. PW-7316 Food Industries.

FOOD TECHNOLOGIST—Administrative, technical, production, sales experience. Age 37. Seeks change to position of additional responsibility. PW-7329, Food Industries.

COST ACCOUNTANT with industrial and agricultural experience. M.S. degree in Agriculture, capable, versatile, with intensive experience in large scale crop production and marketing, Standard Costs, Cost Analysis, Production Control, also in General Accounting and Time Study, seeks opportunity with Agricultural Processing Company. Desire to leave present position to be near members of family on the West Coast. References exchanged. PW-7345, Food Industries.

WANTED
Exclusive Lines

By new jobbing concern servicing Candy Factories, Bakeries, Dairies, and kindred Industries in the East.

P. O. Box 1204, New York 8, N. Y.

POSITIONS WANTED

ADMINISTRATIVE FOOD Technologist — desires change to position with greater opportunities. 13 years experience. Exceptional record. PW-7330, Food Industries.

SELLING OPPORTUNITY WANTED

QUALIFIED SALES Engineer in California desires additional line for sale to milk, beverage or food processing industry. SA-7322, Food Industries.

COURSES IN FOOD TECHNOLOGY

a. Mathematics and Chemistry of Food Technology
b. Food Analysis
c. Nutrition
d. Canning
e. Freezing
f. Preserving
g. Inspection and Grading according to USDA standards
h. Mold Counting and Insect Examination

RESTAURANT MANAGEMENT
GENERAL STUDY OF COOKING
PREPARATION OF SALADS
PIE AND PASTRY MAKING
CAKE DECORATING
STUDY OF MEATS

MEN OR WOMEN
VETERANS OR NON-VETERANS
DAY AND NIGHT CLASSES

Highly qualified instructors with practical experience as well as European and American degrees in their respective fields.

ATTENTION EMPLOYERS

If you need qualified personnel, such as: Food Technologists, Laboratory Technicians, Mold Counters, Foremen, Foreladies, Graders and other trained personnel for Quality Control Work please contact the Employment Office of the school.

MIAMI SCHOOL FOR FOOD PROCESSING SPECIALISTS

Box 383 CORAL GABLES 34, FLORIDA
Telephone: 83-1301

WANTED

Large engineering firm wishes to acquire several complete food plants through purchase of (1) capital stock, (2) assets, (3) machinery and equipment, whole or in part. Personnel retained where possible; strictest confidence.

Box 1219, 1474 Broadway, N. Y. 18, N. Y.

When Answering
BOX NUMBERS...

to expedite the handling of your correspondence and avoid confusion, please do not address a single reply to more than one individual box number. Be sure to address separate replies for each advertisement.

CHOICE MODERN REBUILT EQUIPMENT

Guaranteed For Complete Sastisfaction

UNION Rebuilt Machinery — Established 1912

Day and Robinson 100, 600, 1000, 2400 lbs. Dry Powder Mixers and Sifters.

Robinson #4, 800 lb. stainless Dry Powder Mixer and stainless steel Sifter, Screw Elevator for unloading & loading.

J. H. Day Brighton 50 gal. change-can Mixer.

F. J. Stokes, J. H. Day, New Era, Hottman Mixers, from 2 gallons up to 450 gallons, with and without Jackets, Single and Double Arm Agitators.

Baker Perkins BB, JNM & Readco Heavy Duty 50, 100, 150 gal. Double Arm Jacketed Mixers, Sigma or Fish Tail Blades.

Savage 60 gal. S.S. Pat'd. Tilting and Mixing Kettle.

Mikro 4TH, 2TH, 1SH and Bantam Pulverizers; Jay Bee 3AT and U1 Schutz O'Neill, Stedman Mills.

Schutz-O'Neill #3 Sifters; Gayco 8 ft. Air Separator.

Colton, F. J. Stokes and Eureka, RD3, DDS and DDS2 Rotary Tablet Machines.

Pony M, ML and MX Labelrites, Ermold and World Semi and Fully Automatic Rotary and Straightaway Labelers.

Pneumatic Scale automatic Duplex Straight-line Labeler, 120 per min., front and back labels, Flasks and Quarts.

Knapp E adj. Wraparound and Spot Labeler, also for jars with ears.

Burt Automatic Wraparound Labeler.

Stokes & Smith G1 & G4 Auger Fillers.

Triangle Package Models G2C, G2S, A2C, N2CA & A60A Electri-Pak Fillers.

Triangle SHA Auto. Net Weigher, High Speed adj. Semi-Auto. Carton Sealer.

Horix Stainless Steel Rotary Filler.

Filler 1, 2, 4, and 8 head Stainless Steel automatic Piston Fillers, Rising Bed feature and automatic Feed.

Stokes 90D auto. Tube Filler & Closer.

Ayars Rotary Filler #10 Cans, etc.

Colton 4 PF Worm-type Cream Filler.

F. J. Stokes #47 hand-operated Cream Filler, #49 Closer and #48 Crimper. Amsco and Heat Seal-it 15D "Pacer" auto. Cellophane Bag Sealers.

Ceco auto. Carton Closing Machine.

Standard Knapp No. 429 Carton Sealer.

Package Machinery Co. Model FA, FA2 Wrappers; Miller & Scandia SSU1 automatic Cellophane Wrappers.

J. H. Day 35 and 75 gal. Imperial double arm steam jacketed Mixers.

Sweetland, Vallez, Sperry, Shriver, Republic and Ertel Filter Presses.

Huhn Steam & Gas-fired Rotary Dryers. A. O. Smith and Hersey 6 ft. x 23 ft. Rotary Steam Tubular Dryers.

Pneumatic Scale auto. Tite-Wrapper.

Smith Buffalo 20", 27" & 42" Choppers.

Sterling, Anderson and Erschel Dicers.

THIS IS ONLY A PARTIAL LIST

OVER 5000 MACHINES IN STOCK - TELL US YOUR REQUIREMENTS

Union STANDARD EQUIPMENT CO.
318-322 LAFAYETTE ST., NEW YORK 12, N.Y.

Top Prices Paid For Your Surplus Equipment

FOR SALE

Carton Gluer: Packomatic, with Sealer.
Belt Conveyors: 10', 12', 16', 20', 30', 40'.
Powder Mixers: 100 to 2000 lb. capacities.
Tank: 200 gal. stain. steel, agitated
Mixer: 120 qt. Glen Power Plus, var. speed.
Powder Mixers: 100 to 2000 lb. capacities.
Kettles: Stain. Steel, all sizes, new and used.
Hammer Mills: Prater 5 to 40 hp.
Powder Fillers: Stokes & Smith, Stokes, Triangle, Gump, McMinn, Howes, Day, Weigh Right.
Filter Presses: 7", 12", 24", 36" cast iron.
Fillers: Geyer, Kiefer, Visco, M&S, Elgin.
Filler: Mojonnier No. 60 st. steel.
Labelers: New Jersey, World, Knapp, Burt
Heat Sealers: Doughboy and Amsco.
Cappers: Resina, Capem; Pneumatic, U. S.
Powder Mixers: 30 cu. ft. stain. steel.

Send us a list of your idle equipment

LOEB EQUIPMENT SUPPLY CO.
1931 W. North Ave. Chicago 22, Ill

FOR SALE

28"x60" to 32"x120" Double Drum Dryers.
100 gal. S.S. Clad Jkt. Kettles, 30"x52".
100 to 300 gal. S.S. Mix Tanks, water jkt.
350 gal. S.S. Tank, 54"x36" with coil.
2—Stainless Steel Cells, 3", 8 turns.
Ft. Wayne Sterilizer, (galt.) 4'x4'6".
Premier Colloid (Paste) Mill, 7½ H.P.
2000 and 3000 gal. Pfaudler Tanks, agit.
125 to 1500 gal. Homogenizers or Viscolizers.
36" Rogers Copper Vacuum Pan.
26" Mojonnier Stainless Steel Vacuum Pan.
D-8 Day Mixer, jacketed, m.d., 800 lbs. cap.
"Lightnin" Portable Mixers, 1/3 and 1/4 H.P.
Model 148C Stokes High Vacuum Pump, 1½ H.P.
World Automatic Rotary Labeler.
Elwell Parker Skid Lift Trucks, 4000 lbs.
3—Neptune Meters, Style 3, 1½" or 2".

Send us your inquiries

LESTER KEHOE MACHINERY CORP.
1 East 42nd Street, New York 17, N. Y.
Murray Hill 2-4616

FOR SALE—MODERN PACKAGING EQUIPMENT

LATE MODEL

PNEUMATIC SCALE CO. 35 Per Minute **AUTOMATIC CARTONING LINE** Automatic Feeder, Bottom Sealer, Liner, Filler, Top Sealer & Compression Unit.

PNEUMATIC SCALE CO. Medium size, Double Package Makers
PNEUMATIC 20 spout automatic Vacuum Filler
PNEUMATIC SCALE CO. Tightwraps
PNEUMATIC SCALE CO. Wax Inner Liner.
PNEUMATIC 2 Scale Net Weight Filler
PNEUMATIC 4 Scale Net Weight Filler
PNEUMATIC Top Tucker for Cartons
PNEUMATIC Automatic 4 Head Capper
PNEUMATIC Single Head Automatic Capper
CAPEM 4 Head Automatic Capper
RESINA Automatic Cappers, 1 and 2 Head
FILLER MACHINE CO. 2 and 4 Spout Stainless Steel Piston Fillers
PACKOMATIC Cartoning Unit, 8" and 12" sizes. Bottom Sealer, Filler and Top Sealer
STOKES & SMITH Model G Auger Fillers
DRIVER 2 Scale Net Weight Filler
TRIANGLE Top and Bottom Carton Sealer with Compression Unit. For large size cartons.
CECO 12" Adjustable Top & Bottom Carton Sealer
STANDARD-KNAPP 429 Top & Bottom Case Sealer
FRED GOAT Check Weighers
WORLD fully automatic Straightaway Labelers for front and back labels. 60 and 120 per min.
WORLD Automatic Rotary Labeler.
STANDARD-KNAPP, BURT Can Labelers
STANDARD-KNAPP Vertical Labeler
N J Pony Labelrite Labelers
NATIONAL, WORLD, ERMOLD Spot Labelers
ISLAND Uncrambler
POWDER MIXERS & SIFTERS 200 to 1000 lbs.
PROCTOR & SCHWARTZ 14 Tray Shelf Dryer
COLTON Tablet Machines, Model 3DT
LEHMAN 12"x24" 3 Roller Granite Mill
CHAMPION Wire Stitcher

WANTED
Single Machine or Entire Plants

ALLIED EQUIPMENT CO.
940-946 Nepperhan Ave., Yonkers 3, N. Y.
Phone: Yonkers 5-0442

HIGHLY DESIRABLE EQUIPMENT
At Terrific Savings

Pfaudler Steam Peeler complete with Boiler
Can Labelers—up to #10 Tins and Gallons
2 Transwrap Machines, Models AA & A
Urschel Dicers Model B&L & Diana #7
FMC S.S. 18 spout Juice Filler
Dunning & Boschert 80 ton Fruit Press Monel
N. J. Pony Labelers semi automatic and all automatic, all models
3 Pneumatic Scale All Automatic Duplex Labelers, for all size containers
Automatic World Twin Turret Labeler
S.S. Piston Fillers—all sizes and makes
Sparkler & Niagara S.S. Filters
S.S. Tanks & Kettles, all sizes

For BETTER BUYS and Service
Phone SOuth 8-4451—9264—8782

You can BANK on

EQUIPMENT CLEARING HOUSE, INC.
289—10th St. BKLYN 15, N. Y.

BUY BRILL

6—Ross 2-Truck Steam Tray Dryers, 500 sq. ft. drying surface, with trucks.
1—Oliver 3' x 2' Rotary Vac. Filter.
4—Shriver 30", 24", 18", 12" Cast Iron P&F Filter Presses.
2—#2 Sweetland Filters, Stainless Steel.
1—Kowen 200 gal. closed steel jacketed agitated Pressure Kettle.
2—Tolhurst 40", 32" Suspended Centrifugals, monel perforated baskets.
1—Tolhurst 26" S.S. Centrifugal, solid basket.
1—Fletcher 32" Suspended Centrifugal.
1—Tolhurst 26" Suspended Centrifugal.
5—Rotex Sifters, 20"x48", 40"x36", 40"x120".
1—Pfaudler 100 gallon glass-lined jacketed, agitated Kettle, S.S. agitator.
25—S.S. Kettles and Tanks, 50 to 500 gal.
2—Knapp, Burt Automatic Can Labelers, 2 10cans.
3—Mikro Pulverizers #1SH, 2TH, and 4TH.
12—Day, Robinson Powder Mixers, 100 to 4000#.
2—Stokes & Smith Model G1 Fillers.
3—Anderson Duo Oil Expellers with tempering apparatus.
3—Davenport 6'x50', 5'x25' Rotary Steam Tube Dryers.
1—Black & Clawson 28"x60" Atmospheric Double Drum Dryer.
3—Oliver Air Operated Diaphragm Pumps.

SEND FOR COMPLETE STOCK LIST

Get Our Quotations and Compare

BRILL EQUIPMENT COMPANY
2401 Third Avenue, N. Y. 51, N. Y.
Telephone Cypress 2-5703

"FIRST" LESSON IN PURCHASING GOOD PROCESSING EQUIPMENT

Deal with a reliable house

Used equipment with a Guaranty that counts . . . backed by a modern machine shop, large warehouse inventory, twenty-two years of square dealing.

Add the further protection of the FMC Rental-Purchase Plan, "trying before buying" so that you may take full advantage of the savings in good rebuilt equipment.

When the BIG BOSS says "NO" to a large appropriation, turn to Used Equipment . . . order it with full reliance on your reputable dealer.

Fred R. Firstenberg, Pres.

FIRST MACHINERY CORPORATION

157 HUDSON STREET, NEW YORK 13, N. Y.

USED EQUIPMENT FOR SALE

Model 90 RH No. 210 Mojonnier Filler and Capper; York pasteurizer—9 chambers with compressor tank; glass lined and stainless steel storage and mixing tanks—60, 100, 200, 300 and 500 gallon capacity; vacuum fillers — rotary and straight line; automatic and semi-automatic labelers; 42 inch wood filter press with 30 chambers; plate and frame filters, and disc filters in many sizes and capacities; water filters; portable agitators; roller conveyors; heat exchanger; belt conveyor tables; all types of pumps; 25 H. P. oil fired boiler complete with tanks, pump and controls; 7 vertical steel tanks manut lined complete with coils; motors, and many other items.

THE FILTER PAPER COMPANY

2460 South Michigan Avenue, Chicago 16, Illinois
Tel. Calumet 5-8900

FOR SALE

12—500 gallon Jacketed Copper Kettles
1—250 gallon Jacketed Copper Kettles
2—150 gallon Jacketed Copper Kettles
1—2800# Swiss Cheese Kettle

All sizes Stainless Steel Kettles—new.

BUCYRUS KETTLE WORKS, INC.
729 E. Warren St. Bucyrus, O.

1—500 kw, WESTINGHOUSE, 1200 RPM, 3 PHASE, 60 CYCLE, 480 VOLT AC GENERATOR DIRECT CONNECTED THROUGH WORTHINGTON GEAR TO A WORTHINGTON - MOORE TURBINE, 275 POUNDS; BLEEDER PRESSURE, 10 POUNDS; EXHAUST, 1 POUND, ABS.

The generator panel is complete with 1000 amp, air circuit breaker, the usual instruments, voltage regulator, etc. There is also, with the unit, a Wheeler surface condenser with motor-driven circulating pump and condenser removal pump.

This equipment is located in Oakland, California, and has never been used. It can be purchased at a bargain. Please address your inquiries to:

ALBERS MILLING COMPANY
5045 Wilshire Blvd.
Los Angeles 36, California
Attn: W. G. FISHER

EQUIPMENT

FOR FOOD AND PROCESS INDUSTRIES

1—Pfaudler glass lined jacketed Reactor, 50 gal. cap. Series P.
3—Pfaudler glass lined jacketed Reactors, 2000 gal. cap.
6—Pfaudler glass lined jacketed Reactors, 1000 gal. cap.
11—Pfaudler glass lined jacketed Kettles, 400 gal. cap.
27—Pfaudler and Glasscote glass lined jacketed Kettles, 150 to 450 val. cap.
1—Stainless Steel jacketed Kettle, 500 gal. cap.
3—Stainless Steel jacketed Reactors, 1000 gal. cap.
1—Stainless Steel jacketed Reactor, 70 gal. cap., Anchor-type agitator.

R. GELB & SONS, INC.
Est. 1886 UNION, N. J.
UNionville 2-4900

Charles S. JACOBOWITZ Co.

1088 MAIN BUFFALO 14, N. Y. PHONE AMherst 2100

FOR SALE—50% or More Off!

Haller 18-spout ss. filler with new valves.
Karl Kiefer 16-spout ss. vacuum filler.
Elgin 20-spout rotary gravity filler.
International 24-spout rotary vac. filler.
Evrdy-Geyer piston filler for greases, etc.
Standard Knapp straight line vertical labeler for wraparound labels, used 6 months.
Capom 4-hd screwcapper, 28mm., used 3 mos.
New Par 1-HP Freon compressor, never used.
York 4x4 ammonia compressor, used 3 mos.
Kiefer 72-spout btl rinser, reconditioned.
3 Cherry Burrell 200-gal. ss. pasteurizers.
Lowe Hydro washer for half gallons.
Clayton 10-HP steam generator, used 3 mos.
2 Lee 50-gal. ss. Type "C" tilting kettles.
30-gal. alum. jacketed kettle with agitator.
250-gal. copper jacketed kettle.

Partial Listing Only! Other fillers, cappers, labelers, kettles, tanks, etc. All owned by us and in our stock in Buffalo or New York. All subject to prior sale. All late model equipment, priced 50% or less of new price! **We also buy your surplus equipment.**

Serving American Industry for over 25 Years

WHERE TO BUY

WHERE TO STORE FROZEN FOODS

- Contact Meters
- Pyrometers

SIM-PLY-TROL ASSEMBLY PRODUCTS, INC.
Chagrin Falls (4), Ohio

QUAKER CITY COLD STORAGE CO.
PHILADELPHIA, PA
3 WAREHOUSES
Proper Temperature for Frozen Foods

"SEARCHLIGHT"

IS

Opportunity Advertising

—to help you get what you want.
—to help you sell what you no longer need.

Take Advantage Of It

For Every Business Want

"THINK SEARCHLIGHT FIRST"

LIQUIDATION!

Complete Starch & Glucose Plant

Hatfield, California

REAL ESTATE—MACHINERY—EQUIPMENT

2—Vallez Rotary Leaf Filters #49
1—Stokes 4' x 20' Rotary Vacuum Dryer
2—Sperry Filter Presses 36" Recessed 36 Chambers
1—7' Copper Coil Vacuum Pan
1—6' x 16' Stainless Steel Converter
1—6' x 13' Monel Converter
2—Bird 40" Steel Basket Centrifugals, M.D.

1—Adt Rotary Press
1—Adt 5' x 35' Rotary Steam Tube Dryer
1—Louisville 36" Roll Press
20—Smithway Vibrating Screens
4—Smithway Rotary Extractors
1—Worthington 6"x6"x5"x5" Compressor
2—Acme Water Tube 200 HP Boilers

Motors—Pumps—Tanks—Machine Shop—Steel—Pipe
Complete Chemical Laboratory

Send For Complete Listing

WRITE—WIRE—PHONE

All Offerings Subject To Prior Sale

DULIEN STEEL PRODUCTS, INC.
of Washington
9265 E. MARGINAL WAY
LANDER 6000
SEATTLE 8, WASH.

FOR SALE

2—MOJONNIER #90 Auto. Rotary Vacuum Fillers, 14 spout, stainless.
1—INTERNATIONAL Auto. Vacuum Filler, 12 spout, stainless steel.
1—Stokes & Smith G-I-D Universal Powder Filler.
1—Natl. Pack. Mchy. Auto. Powder Filler, 2-spouts in tandem.
1—Filler Mach. Co. 4-Piston Filler. Automatic.
1—Single Piston Filler.
2—Sharples Super Centrifuges #16V, Vaportite, dual purpose bowls, stainless steel contact parts.
3—Filter Presses, Wood P&F, 30".
6—Filter Presses, C.I. P&F., 10", 12", 24".
1—Sweetland #10 Filter.
6—Powder Mixers, 50#, 200#, 500#, 800#, 1500#.

Large stock of stainless steel tanks and kettles

PERRY EQUIPMENT CORP.
1511 W. THOMPSON ST. • PHILA. 21, PA.

FOR YOUR PROTECTION

Buy from a Reputable Dealer

You actually save money when you buy Used Equipment from a reputable dealer. His guarantee or representations eliminate the element of chance.

SPECIAL ITEMS AVAILABLE

1—Tolhurst S.S. 48" Sus. Style Centrifuge, Perf. Basket DMD.
1—ATM Co. S.S. 26" Sus. Style Centrifuge, Solid Basket DMD.
1—Pfaudler Stainless Steel 150 Gal. Reactor (New).
3—Type 347 Stainless Steel Closed Tanks 3,450 Gals.
7—Type 347 Stainless Steel Coils 5' to 8' dia.
4—Type 347 Stainless Steel Bubble Cap Columns 6' x 30'.
2—Roball Sifters 40" x 84" Stainless Steel.
2—Rotary Batch Blenders 157 Cu. Ft. Cap. M.D.

Over 400 additional units available
Send for our Bulletin A-25
We Buy Single Items to Complete Plants

The Machinery and Equipment Corp.
533 West Broadway
New York 12, N. Y. GRamercy 5-6680

One New dual bottle Pony Labelrite

"DRI-LABELER"

No glue necessary—BARGAIN.

MUTUAL SPICE CO.
2125 83 St. North Bergen, N. J.

FOR SALE

100 qt. 6 speed Read Vertical Mixer
80 qt. 4 speed Hobart Vertical Mixer
Enterprise Grinder with 8-⅝" plates, belt drive
Burns Peanut Roasters and Blanchers
80 gallon Stainless Jacketed Kettle 40 lbs. w.s.p.
200 to 300 gallon Copper Steam Jacketed Kettles for 90 lbs. w.s.p.

SAVAGE BROS. CO.
2638 Gladys Ave. Chicago 12, Ill.

"Consolidated"

HEADQUARTERS FOR UNUSUAL SAVINGS

STAINLESS STEEL "ROBALL" SIFTERS

12—Day #71 Stainless Steel "Roball" Sifters, single deck, 40"x84", md. with 2 HP. 3/60/220 volt motors.

3—30"x30" Aluminum Filter Presses: for either 32 or 48 chambers each; 1" cake side feed, open delivery, non-washing. Used on pectin. Two Shriver and one Sperry.

5—Shriver Rubber covered Filter Presses: 36"x36", 36 & 18 chambers, 1½" solid rubber plates, 3" cast iron rubber covered frames, 4 eye, closed delivery.

2—Stainless Steel Rotary Dryers: 6'x40' Ruggles-Coles, for either hot air or direct heat.

1—Std. Knapp Self-Adjusting #429 auto. top & bottom Gluer-sealer, with compression unit.

8—Day Powder Mixers, up to 2,000#.

1—Day All Aluminum jacketed horizontal ribbon Dry Powder Mixer, center discharge.

2—World Rotary Automatic and 8—semi-auto. Labelers.

1—2000 gal. Steel, jacketed Kettle, open top, Agitated, 7" dia. x 7'6" deep.

1—Rotary Vacuum Dryer, 5'x33'.

8—Baker Perkins Size 15 Mixers, jacketed, 100 gal.; 1 size 16, 150 gal. unjacketed.

1—#12 Sweetland Filter, 4" centers, iron or copper leaves.

1—1200 gal. Aluminum closed jacketed Kettle, 5' dia. x 8'6" deep; also 1—750 gal., 1—350 gal.

2—225 gal. Aluminum open, jacketed Kettle, also 1—225 gal., 2—100 gal., 40—80, 60, 40, 20 gal.

20—250 Gal. Copper, jack. Kettles, open top, with stands, 50" dia. x 42" deep.

40—Unused 200 gal. Aluminum Storage Tanks, 30% of new cost.

ONLY A PARTIAL LIST

THE KEY TO SAVING TIME AND MONEY
CONSOLIDATED PRODUCTS COMPANY, INC.
13-17 Park Row New York 7, N. Y.
We buy your idle Machinery

Koronet HAIR GUARDS

NOW...

SERVING OVER **50%** OF THE NATION'S FOOD INDUSTRIES!

SAVING OVER **70%** OF YOUR WOMEN WORKERS' HEADWEAR COSTS!

KORONET HAIR GUARDS ARE NATIONALLY FAVORED *Because*

- ✓ They are sanitary. Hair always completely covered—simply, smartly. Permit natural air circulation.
- ✓ They are economical. Cost only a few pennies more than an ordinary hairnet. Neatly webbed of strong, durable texture, designed for long service. No laundering, starching or ironing bills.
- ✓ They provide utmost protection. No loose or falling hair. Comply with all provisions of the Pure Food Act. Highly recommended by government food inspectors.
- ✓ They are comfortable. Cool, light, snug fitting, adjustable to any headsize.
- ✓ They are attractive. Flattering with all modern hair styles. Lend pleasing air of uniformity to bath plant and employee appearance.

● Wherever introduced, Koronet Hair Guards have been enthusiastically approved by both management and employees alike. They are now a prime requisite in major food processing plants here and abroad. By providing your women workers with this economical, sanitary and attractive product you are performing an essential service for your plant and your employees.

ADVERTISING VALUE!

The KORONET Hair Guard is an exclusive patented product. Any name, trademark or slogan you desire can be imprinted on the shield in your choice of one or more colors. This is an ideal and inexpensive way to advertise your products.

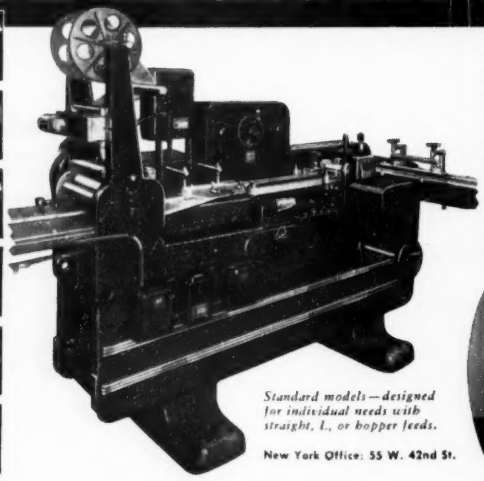
Free Samples! *Take advantage of this offer. Prove to yourself that Koronet Hair Guards are a must for your plant. Write today for FREE SAMPLE, literature and prices!*

REGAL MFG. CO. 3203-05 ELSTON AVE. CHICAGO 18, ILLINOIS

Put zest in Bakery sales

with moisture-proof OVEN-FRESH

HIGH SPEED PACKAGING OF CAKES · COOKIES · ETC.



Standard models—designed for individual needs with straight, L, or hopper feeds.

New York Office: 55 W. 42nd St.

Modern machine "float" wraps your products in single or multiple units at continuous feed speeds up to 120 packages per minute—and *without breakage!* Wraps products of all shapes with materials of all types and protects "Oven Freshness" by hermetically heat or glue sealing flavor and freshness in—moisture where you want it. Reduces production costs all-around with less materials and less labor . . . Only one operator and helper required to feed and box pack. Write for illustrated brochure and details today.

Campbell WRAPPER

HUDSON-SHARP MACHINE CO. · GREEN BAY, WIS.
Manufacturers

FINDLEY NO. 450

LABEL-WELD*

AMERICA'S FINEST BOTTLE LABEL GLUE

LABEL-WELD is exceptionally uniform under wide temperature variations. Summer or winter, viscosity is always right for perfect machining. There are no disagreeable ammonia or carbolic acid odors; no dilution is necessary . . . and cleaning is easy with a brush and alkali solution. Water resistance second to none.

LABEL-WELD machines clean . . . sets fast . . . gives marvelous mileage on all types of equipment. Get the facts today! Better still . . . send for a trial order.

PROVEN SUPERIOR BY ACTUAL TESTS

Impartial tests show LABEL-WELD to be outstanding . . . the finest bottle label glue obtainable. Let us prove it.

* Trademark

plants at MILWAUKEE AND HOUSTON
sales offices in CHICAGO, KANSAS CITY, NEW ORLEANS, DALLAS, HOUSTON, MINNEAPOLIS, KALAMAZOO, LOUISVILLE, AND OGDEN, UTAH

Findley's INDUSTRIAL ADHESIVES exclusively

THE F. G. FINDLEY COMPANY • 3059 W. PEMBERTON AVENUE • MILWAUKEE 10, WIS.

are you "up-to-date" on SPRAY NOZZLE developments . . . *for example*

✓ Spraying Systems Pneumatic Atomizing Nozzle with Cleanout Needle . . . spring loaded cleanout needle is open in normal position. When pushed into orifice, cleans out entire orifice passage. Write for Data Sheet 4198.

✓ Spraying Systems Pneumatic Atomizing Nozzle for Automatic Operation . . . provides intermittent operation. Typical use is automatic lubrication of molds . . . with lubricating operation indexed to press cycle. Write for Data Sheet 4547.

✓ Spraying Systems Pneumatic Atomizing Nozzle with Steam Jacket . . . for spraying liquids requiring above-room temperature. The nozzle is easily removed from the jacket. Write for Data Sheet 4610.

WRITE and tell us the details of what you want to accomplish in spraying . . . our engineering facilities are at your service. Also . . . do you have General Catalog No. 22?

SPRAYING SYSTEMS CO. BELLWOOD, ILLINOIS
3212 RANDOLPH STREET
(Suburb of Chicago)

WHAT MAKES A MAILING CLICK?

Advertising men agree--the list is more than half the story.

McGraw-Hill Mailing Lists, used by leading manufacturers and industrial service organizations, direct your advertising and sales promotional efforts to key purchasing power. They offer coverage of major markets, including new personnel and plants. Selections may be made to fit your own special requirements.

New names are added to every McGraw-Hill list daily. List revisions are made on a twenty-four hour basis. And all names are guaranteed accurate within two per cent

In view of present day difficulties in maintaining your own mailing lists, this efficient personalized service is particularly important in securing the comprehensive market coverage you need and want. Ask for more detailed information today. You'll probably be surprised at the low over-all cost and the tested effectiveness of these hand picked selections.

DIRECT MAIL DIVISION
McGraw-Hill Publishing Company, Inc.
330 WEST 42nd ST. NEW YORK, N.Y.

"WELL---
WHADDA YA KNOW!"

No—this man hasn't discovered who murdered the butler and stuffed his body in the bath-tub.

He's reading an advertisement in THIS magazine! He has his eye on a product that promises the answer to a brand new problem he's been sweating over.

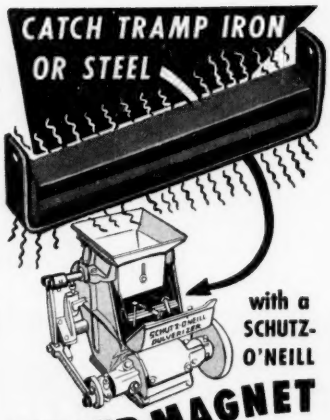
Exaggerated? Not a bit! For the advertising pages of every McGraw-Hill publication are replete with ideas, products, services designed for the men who are responsible for design, production, maintenance, marketing—every specific operational phase of modern business and industry.

Month after month America's leading manufacturers are parading their newest and best wares before your eyes in THIS McGraw-Hill magazine. You're the judge and jury as to whether they can *solve a problem—offer a short-cut—show a profit*—for you.

To keep in touch with the parade------

READ THE ADS.

CATCH TRAMP IRON OR STEEL



with a SCHUTZ-O'NEILL

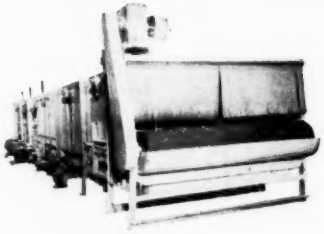
SUPER MAGNET

Schutz-O'Neill powerful permanent SUPER-MAGNETS will be full strength 10 years from now. They will take iron or steel out of any dry product flow line. No power cost — no switch — SUPER-MAGNETS positively catch all nails, screws, bolts, wire, filings, etc. Saves your equipment, eliminates spark fire hazard, prevents metal contamination of your product.

Standard equipment on feeders for *Schutz-O'Neill Pulverizers* as shown above, SUPER-MAGNETS are adaptable to a great variety of applications. Write for literature.

ESTABLISHED 1893 SCHUTZ-O'NEILL CO.

309 Portland Ave., Minneapolis 15, Minn.



THE NEW EFFICIENT Ultimate JAR COOLER and/or PASTEURIZER

The new improved Jar Cooler and/or Pasteurizer is just what you need . . . unitized bolted construction . . . automatic feed and discharge . . . made in three widths . . . up to 72 ft. in length (multiples of 12') . . . steel or stainless steel . . . additional sections can be added at any future date.

Write now for Bulletin JC-1A

ISLAND EQUIPMENT CORP.
Brewster Rolls Royce Building
27-01 Bridge Plaza, North • Long Island City, N. Y.

A GAYLORD Package Modernization Program Can Stimulate Sales and Increase Profits for You

Increased sales and profits should be the principal objectives in a package redesigning program. Gaylord, working toward this end through research and engineering and with the employment of Quanta Color designing—has been successful in accomplishing these objectives for many manufacturers. You can put Gaylord's experience and facilities to work for you, too. Just call the nearest sales office.

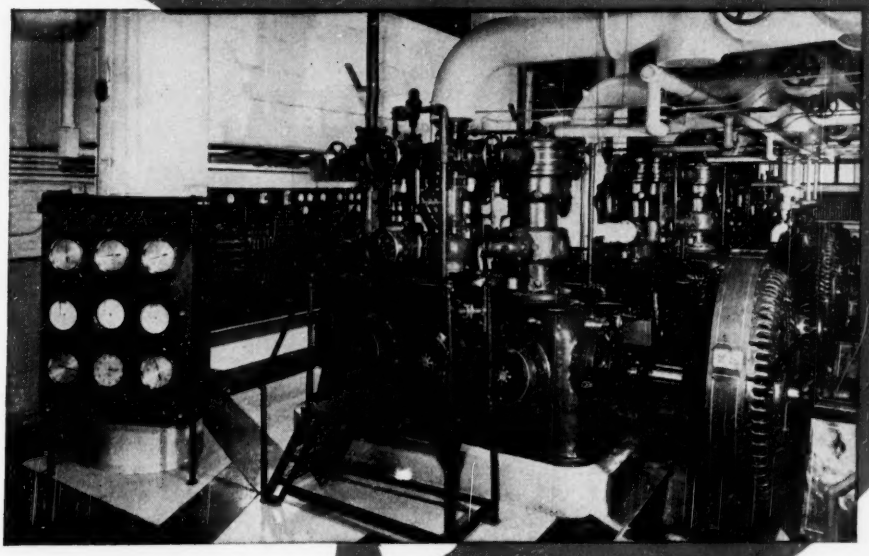
Gaylord Boxes

CORRUGATED AND SOLID FIBRE BOXES • FOLDING CARTONS • KRAFT BAGS AND SACKS • KRAFT PAPER AND SPECIALTIES

GAYLORD CONTAINER CORPORATION, General Offices: **ST. LOUIS**

New York • Chicago • San Francisco • Atlanta • New Orleans • Jersey City • Seattle • Indianapolis • Houston • Los Angeles
Oakland • Minneapolis • Detroit • Jacksonville • Columbus • Fort Worth • Tampa • Cincinnati • Dallas • Des Moines • Oklahoma City
Greenville • St. Louis • San Antonio • Memphis • Kansas City • Bogalusa • Milwaukee • Chattanooga • Weslaco • New Haven
Appleton • Hickory • Greensboro • Sumter • Jackson • Miami • Omaha • Mobile • Philadelphia • Little Rock • Charlotte • Portland

LOW TEMPERATURES AT LOWER COST



WHEN you lubricate compressors with TEXACO CAPELLA OILS

Your cost per ton of refrigeration is lower when your compressors run at top efficiency, and performance is smooth and trouble-free. To assure these benefits, lubricate with *Texaco Capella Oils*. They are preferred by operators everywhere.

Texaco Capella Oils keep compressors clean. Elements that might form harmful deposits have been carefully removed, assuring extreme stability and resistance to oxidation, gum and sludge formations. In addition, *Texaco Capella Oils* are moisture-free, do not react with refrigerants, and have very low pour tests.

You can get *Texaco Capella Oils* in proper viscosities for any compressor or any set of operating conditions. A Texaco Lubrication Engineer will gladly help you select the right ones to assure maximum efficiency and minimum maintenance costs.

Just call the nearest of the more than 2,000 Texaco Wholesale Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TEXACO Capella Oils

FOR ALL AIR CONDITIONING AND REFRIGERATING EQUIPMENT

TEXACO